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# GLOUCESTER EPIDEMIC

OF

## SMALL-POX,

1895-6.



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# Report

OF THE

## Committee Appointed by the Board of Guardians

TO ORGANISE AND CARRY OUT THE

## GENERAL VACCINATION OF THE CITY AND

## DISTRICT.

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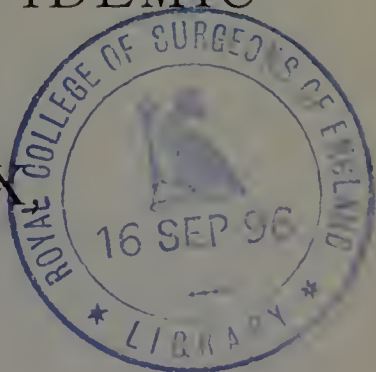
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GLOUCESTER :

H. OSBORNE, PRINTER.



## REPORT.

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THE Committee appointed by the Board of Guardians of the Gloucester Union during the recent epidemic of Small-pox, for the purpose of organising and carrying out the general vaccination of the district, submit herewith, for the information of the Board, a Report on the work which they have done.

As this Report may, in consequence of the magnitude and general importance of the epidemic, have more than a mere local and temporary interest, it is well to state that the area with which it deals (that of the Gloucester Poor Law Union) comprises two separate Sanitary districts, *viz.*, the City of Gloucester proper, under the control of the Gloucester Urban (County) Council, and the remainder of the Union, which is administered by the Gloucester Rural (District) Council.

The population of the whole of the Union at the census of 1891 was 50,907; of which 39,444 were contained in the Urban and 11,463 in the Rural district. Assuming that both districts have increased in population since the date of the census at the rates at which they increased in the previous decennial period, the population of the Urban district at the end of 1895 would be 40,616, and of the Rural 11,887. The Urban population as given by the census included the Wotton County Lunatic Asylum with 696 inmates, and the Gloucester Prison with 87 inmates, both of which, though inside the City boundary, are considered, for administrative purposes, to be in the County (Gloucester Rural District).\*

Of 11,887 persons assumed to be residing in the nominally Rural district of Gloucester, upwards of 1,800 live in two sanitary sub-districts, known respectively as the East End and the South End; the latter of these being so closely related to the

\* The inmates and staffs of the Wotton Asylum and the Prison at the time of the epidemic may be taken at about 650 and 100 respectively.

City that it would be impossible for anyone unacquainted with the precise boundary of the City in this neighbourhood to tell where the Urban district ends and the Rural begins; whilst the former, though distinctly demarcated from the City by the line of the Great Western Railway, which here forms the boundary, is mostly occupied by persons employed in the City, and may for all practical purposes be considered a part of it.

It will be seen from the tabular statement of the results of the house-to-house visitation instituted by the Committee (Appendix A) that the total population of the City accounted for in that way is only 39,857, leaving a discrepancy between that and the estimated population of 759. This discrepancy may be explained in several ways; (a) by an excess in the assumed rate of increase; (b) by an error in the assumed number of inmates in the occupied houses from which no information could be obtained; (c) by the absence of a good many of the inhabitants of the City, many unvaccinated children especially having been sent away in the early portion of the epidemic to escape the disease or the necessity of being vaccinated; (d) by the existence of some doubt as to how many of the 250 patients then in the Small-pox Hospital were accounted for in the survey.

Adding the population of the two sub-Urban districts (East End and South End) to that of the City proper we obtain an approximate population not far, if at all, short of 42,000 as living within what is generally recognised as Urban Gloucester.

For the same reason, also, it may be desirable to record briefly the circumstances which preceded and led up to the appointment of the Committee, without a knowledge of which a very inadequate idea might be formed, both of the scope and importance of the work which was imposed upon it, as well as of the difficulties which it had to encounter.

For this purpose it is necessary to go as far back as February 8, 1887, when the Board of Guardians, by a majority of 12 votes to 10, out of 30 present, and a total of 53 elected, and nearly as large a number of *ex officio* Guardians, resolved, "That the Vaccination Officers take no further steps in vaccination prosecutions until authorised by this Board." From that date until quite recently no further action in regard to vaccination was taken by the Board, and no prosecutions have been instituted until the present year.

As a matter of pure history, and in explanation of a decision which might otherwise appear inexplicable, it may be mentioned that a few years previously a local Anti-Vaccination



Society had been established in Gloucester, to the operations of which the passing of this resolution as well as the subsequent inaction of the Board are unquestionably due.

The result of this resolution, enforced, as it was, by an unopposed agitation against vaccination carried on continuously by the same Society, was, as might have been expected, to produce a general decline in the number of children vaccinated in each successive year, as shewn in the following tabular statement of public and private vaccinations registered during the last 10 years :—

				Total.
1886	..	..	..	1095
1887	..	..	..	472
1888	..	..	..	140
1889	..	..	..	95
1890	..	..	..	60
1891	..	..	..	34
1892	..	..	..	39
1893	..	..	..	38
1894	..	..	..	34
1895	..	..	..	371
Total Vaccinations in 10 years ..				2378
"	"	"	9 " (1887-95)	1283

During these ten years, as also for the twelve which had preceded them, since the epidemic of 1873, Gloucester was practically free from small-pox, only an occasional case or two having occurred from time to time, the infection of which was without difficulty stamped out. In May of last year a case was reported in one of the suburbs of the City, which was followed at intervals by a few others in the City itself and in the suburbs, the numbers augmenting gradually during the last two months of the year, at the end of which a total of 30 had occurred in the city and suburbs.

Up to this time the outbreak was well under control, most of the cases having been removed to the City Isolation Hospital as they occurred, vaccination and re-vaccination applied to those who had been exposed to the infection, and such other measures of a precautionary nature adopted as the Medical Officers of Health of the Urban and Rural districts respectively considered desirable.

Up to this date also the inhabitants of Gloucester had been scarcely aware that small-pox had obtained any hold at all upon the population, nor did they appear alive to the serious risk which they had been running in allowing so large a number of unvaccinated children to grow up amongst them. It will be seen from the above table that although 14,212 births had taken place in the Union from January 1st, 1887, only

1,283 primary vaccinations, or a trifle more than 9·7 *per cent.*, could be found on the registers. In 1895, of 1,587 children born, only 23 were certified as having been successfully vaccinated by the public vaccinators. A much larger number (348) it is true received protection at the hands of private vaccinators, thus indicating that the better advised section of the community were beginning to realise, as the year closed, the danger they were incurring in allowing their children to go unprotected. It is possible that the neglect of vaccination by this class may have been somewhat less than it appears to be, from the fact that, the machinery of registration having become rusty by disuse, there had been great laxity in the granting and forwarding of certificates, and it has not yet been possible to trace the whole of those who may have been vaccinated by private practitioners in the earlier stages of the epidemic.

**Progress of the Epidemic.** After the New Year, the epidemic began speedily to attain alarming proportions, 51 cases of small-pox being notified in January, 142 cases in February, 628 in March, whilst in April the numbers attained their maximum with a return of 779.\* The effect of this increase in stimulating vaccination soon became apparent. Attention had been drawn by the medical profession of Gloucester at a meeting held early in January (Appendix B) to the importance of a general vaccination of the community, and towards the end of that month the public vaccinators had their hands full, whilst private practitioners were equally active.

This demand for vaccination and re-vaccination was also unquestionably largely stimulated by the fact that the Guardians authorised the use by the public vaccinators of calf lymph (Appendix C), which was also being universally used by private vaccinators. Under the combination of these influences, the pressure at the public stations became so great that it was found necessary to relieve it by appointing two Deputy Public Vaccinators, Mr. T. W. Madge and Dr. W. W. Grosvenor, who commenced their duties early in April.

Some of the Elementary Schools having been closed shortly before by the Sanitary Authority, were used as vaccination stations. The Schoolrooms used in the City, and formally sanctioned by the Local Government Board, were St. James's, St. James's Street; St. Luke's, New Street; Old Crypt, Southgate Street; St. Paul's Mission Room, Tredworth; St. Michael's, Russell Street; St. Nicholas', Quay

\* For these figures we are indebted to Dr. Campbell, Medical Officer of Health for the City of Gloucester, who kindly permitted reference to his registers.



Street ; St. John's, Worcester Street ; and Alington, Derby Road. St. Mark's and St. Catharine's Schoolrooms were also used informally when the pressure was great, and also the private residence of Mr. Bibby. Two public stations were also opened in the suburbs, in the Bristol and Painswick Roads respectively, thus bringing the opportunity for vaccination near the homes of the people in every part of Gloucester.

Although a considerable proportion of the population were gradually brought under the influence of vaccination by these means, the number remaining unprotected, especially of children, was still very large, and the epidemic continued to increase seriously.

At this juncture, the City Council were so much impressed with the need for taking more active measures to arrest the spread of the epidemic, that they issued a circular to employers on the subject of vaccination (Appendix D), and put themselves into communication with the Local Government Board on the subject, with the result that a letter was received from the Board, strongly urging a strenuous effort to vaccinate and re-vaccinate the whole of the population as the only means of accomplishing this object (Appendix E). At the same time, Dr. Franklin Parsons, one of the Medical Inspectors of the Board, was sent down to confer with the Council and with the Guardians, and he, in company with the Mayor, the Medical Officer of Health, and others, attended a meeting of the Guardians, at which the Mayor urged an increase of the vaccinating staff, and offered, on behalf of the City Council, to contribute towards the cost.

The Sanitary Committee of the Town Council had already begun this work by inviting some of the local medical men, in consideration of a specified honorarium, to go from house to house, and vaccinate as many as could be induced to submit to the operation. Six qualified practitioners undertook this duty, *viz.*, Messrs. Benson, Hallsworth, Jones, Liston, Williams, and Surgeon Col. Hall. They started work in different quarters of the City about April 6th, guided by the Register of Parliamentary voters, and with some aid from residents in the districts to which they were respectively appointed.

But by the middle of April the epidemic had made such strides that it was evident that some new effort was needed to cope with it. The school stations, in spite of the relatively large numbers who presented themselves at them, left untouched the mass of those who were too apathetic to take the trouble of visiting them. With the exception of those whose employers made re-vaccination a condition of employment, all who presented themselves were volunteers, who had

been led to believe in the protective value of vaccination by the increasing spread of the epidemic, and by what they were beginning to see of its effects as well as of those of vaccination amongst their friends and neighbours. The supply of these was beginning to fall off, but the residue of the hostile and indifferent was sufficiently large to render it worth while to offer greater inducements to vaccination than had been yet afforded, which could only be done by the systematic and exhaustive house-to-house inquiry already recommended, with a personal tender of the protection to all who were found to need it.

**Appointment of Vaccination Committee.** On Tuesday, April 21st, a special Vaccination Committee was appointed by the Board of Guardians for the purpose of organising and carrying out this work, consisting of Messrs. James Clarke (Chairman), C. Gough, J. W. Jeens, J. Jennings, and F. C. Workman. This Committee met every Monday, Wednesday, and Saturday during the time that the work they superintended was being carried on; and occasionally, when necessary, since its termination.

It is interesting to note here that the epidemic had touched its highest point just prior to the appointment of the Committee, the high-water mark of 211 new cases having been reached in the week ending April 9th, the number for the following week being 201, from which date the weekly returns have steadily decreased. It will thus be seen that the efforts already made to promote the general vaccination of the City were beginning to produce their effect; but the Committee at their first meeting felt the necessity of systematising as well as of extending these efforts, more especially of bringing the various agencies which were at work under the direction of a competent head, so as to prevent overlapping, and also with the view of obtaining more exact information as to what had been done, and still remained to do, than was then available. In furtherance of this object, the Clerk applied to the Local Government Board to send down someone to undertake this work, and at the second meeting of the Committee, Dr. Sweeting, one of the Inspectors of the Board, attended, and **Advent of Dr. Sweeting.** proceeded to give the Committee the benefit of his advice and experience, specially advising the adoption of a system of house-to-house inquiry, as was carried out with success a few years previously during the epidemic at Sheffield. He also strongly recommended the suggestion which had been previously made by Dr. Bond, of securing the services of a medical man who, being a good organiser, should superintend the whole arrangement, with the help of a capable local man, as head of the office, so as to help on vaccination and re-vaccination effectively at the homes of the people, or at the works

where they were employed. Dr. Sweeting stated that he was himself unable to undertake any active organising work, but mentioned the names of several medical men of experience in vaccination as suitable for the office. Negotiations were opened with two of these gentlemen, and also with a resident in the City of scientific distinction, whose name had been suggested, but failed in securing the desired object.

The Committee then invited Dr. Bond to undertake the work, which he consented to do on condition that, as his official and other engagements would prevent him giving more than a limited time to it, he should be allowed to select a colleague in whose efficiency he could have full confidence. The Committee agreed to this, and, on Dr. Bond's recommendation, Dr. Ernest Carter, of Cheltenham, was appointed by the Board as his Deputy.

**The Vaccination Machinery organised.** The Committee were also fortunate in securing the services of Mr. Stanway, who volunteered to act as Secretary and Supervisor of all the office work. A room was then engaged in the new County Buildings, Station Road, as a Vaccination Inquiry Office.

The Committee next proceeded to appoint six qualified medical practitioners to act as Assistant Vaccinators—five gentlemen, who had been previously engaged by the City Council, through Dr. Campbell, the City Medical Officer of Health, and one lady—*viz.*, Dr. Legge, Messrs. Atkey, Grossett, Moore and Richards and Miss Bond. Dr. Legge's place was afterwards filled by Mr. Fort.

In addition to the above, the office staff also included thirteen inquiry officers, three clerks, two bill distributors and a boy messenger.

**Sub-division of the City.** The City and environs were then mapped out into thirteen districts, eleven Urban and two Sub-Urban; and an Inquirer was appointed to each, the whole of the staff commencing their duties on April 27th. It may be well to mention that the division of the City into districts had no relation to existing parochial or other divisions, but was arranged so as to facilitate the special object in view. The districts were numbered from 1—13, and were constituted as shewn in Appendix F.

The Guardians had previously advised the inhabitants, by posters, of the intended visitation, requesting them to afford all the information they could to the temporary Vaccination Officers, and pointing out the vital importance of completing the vaccination of the whole population with as little delay as possible.

**General Plan of Procedure.** The general plan of procedure was as follows : the Inquirers were preceded on the previous day and early on the same day by men delivering from door to door handbills of a similar tenour to the poster just mentioned (Appendix G). In each district the special Inquirer went over it, as directed from the office, regularly from end to end, taking street by street and house by house. For each house a printed form was used (Appendix H), which was filled in by the Inquirer as he went along.

Starting at 9 a.m., the Inquirers brought in their returns at (about) 1 o'clock, and again in the evening. These were looked over by the clerical staff, and the names and addresses of those not yet vaccinated, whether willing or not to see the Vaccinator, were extracted and transcribed on to special sheets (Appendix I), with a space for the Vaccinator's remarks. It was intended at first that each district should have its own Deputy Public Vaccinator, as well as its own Vaccination Inquirer, but it was soon apparent that the six Vaccinators who were first appointed were quite equal to overtaking the cases which remained after weeding out from the Inquirers' lists those who had already submitted to the operation at the hands of other Vaccinators, public or private, as well as of those who were protected by a previous attack of small-pox.

As a result of this arrangement it became unnecessary to keep the schools open so many hours as vaccinating stations. They were therefore closed gradually, as circumstances required, and by the 18th of May they were all disused, with the exception of the Old Crypt Schoolroom, which, as the regular place for public vaccination, remained opened at 2.30 on Saturday afternoons.

By the 15th of May all the districts of the City had been gone over once by the Inquirers. This was checked not only by the map of the City but also by a complete list of streets kindly compiled for the Committee and arranged in districts at the City Surveyor's office.

A second inquiry was started on the following day with the view of making the return as complete as possible, by picking up houses, the occupants of which were absent at the first visit, or which were then unoccupied. From this second inquiry valuable supplemental information was obtained.

As the work gradually shrunk, the Vaccination Staff was reduced, and the Inquiry Office was closed on June 22nd, the outstanding work being completed at the Union Workhouse by Dr. Carter and Mr. West.

The general routine of the office and plan of work followed throughout having been thus sketched, some further details may



not be uninteresting concerning matters of special interest with which the work of the Committee brought them into relations.

**Impediments to the work.** The inquiries made by the Inquirers were on the whole answered satisfactorily, though the quality of the returns varied somewhat, according to the individual industry and ability of the Inquirers. Considering the delicate nature of their work, and that they were selected very hurriedly, after very short notice, and that they entered on their work without any training for it, in most cases they did fairly well, and six were recommended for the bonus promised for approved work. In a certain number of cases information was refused by householders or given wrongly, and occasionally resentment was shewn and abuse bestowed on both Inquirers and Vaccinators.

The Deputy Public Vaccinators being mostly strangers to the City and the people, it was thought advisable to obtain for them some influential lay assistance in their house-to-house work. For this purpose a circular letter (Appendix K) was addressed to the clergy and to others known to be interested in the matter, asking if they would accompany the vaccinators in their rounds. These invitations met with a ready response, and the Committee and staff of the Vaccination Office have to acknowledge the valuable assistance to their work rendered by the many ladies and gentlemen, too numerous, even if it would not be invidious, to particularise, and especially by the clergy of the City, many of whom were indefatigable in their efforts to promote the work.

Even with this introduction it was found that considerable hesitation and unwillingness were displayed by many adults to avail themselves of re-vaccination. It was known that many of the large employers of labour had persuaded their workpeople to submit to it, but how far this practice had been generally followed was uncertain. A circular letter was therefore issued on May 4th (Appendix L) to the larger employers, urging the necessity of the general re-vaccination of their *employés*, and asking for information as to what had been done in regard to it. A large number of replies were received: most of them stated that all employed had been re-vaccinated; a certain number availed themselves of the offer contained in the circular; whilst a few were unable or unwilling to induce their workpeople as a body to embrace the opportunity, although in most cases half-pay was allowed to those who were unable to work on account of a sore arm.

**Action of large Employers of labour.** The Committee feel bound to refer specially here to the three largest employers of labour in the City, *viz.*, the Gloucester Wagon Works Company and

the Great Western and Midland Railway Companies. Mr. Alfred Slater, the General Manager of the Wagon Works, when approached on the subject, exhibited the greatest readiness to assist the Committee in their efforts, not only by giving every facility for re-vaccination of the men employed by the Company, including sick pay to those who were temporarily incapacitated for work, but by personally urging the unwilling to submit to the operation for the general good. The result of his efforts appears in a subsequent part of this Report.

From the local representatives of the Great Western Railway Company, as well as from the Directors, the Committee also received valuable support, with the result that only a comparatively small number of the Company's staff remain unprotected.

But the Committee regret to report that in the case of the Midland Company their efforts were much less successful, for, although repeated applications were made to the Directors to induce their *employés* to follow the example of their fellow operatives on the Great Western Company, the General Manager frankly admitted at a late stage of the epidemic that more than 400 of them had not been re-vaccinated. The consequence has been that this large body of men were a standing menace to the community, both in Gloucester and out of it, and contributed in no small degree to keep the epidemic in activity.

**Opposition of Anti-Vaccinators.** In a place where the statements of anti-vaccinators had been accepted and acted on for years as trustworthy, it may be readily understood that the opposition met with from them, even in the face of the abundant and constantly increasing evidence offered by the epidemic itself of the untenability of their contention, was considerable. Meetings were held by them, letters were written to the journals in Gloucester and elsewhere, the services of professional lecturers were invoked, and bills of various kinds were circulated, maintaining that vaccination was valueless as a protection, and that the medical profession were upholding it for purely selfish ends. So largely was this assertion accepted, that the possibility that someone else was to benefit by the operation besides themselves led many to act as if, by accepting free vaccination and re-vaccination, brought to their own homes, they were conferring a favour on the vaccinators, and it often appeared to give an additional zest to a refusal.

**Sentimental objections.** The reasons generally given by objectors were simply that "they didn't hold to it," or "they wouldn't have it done." Very frequently, too, the fatalistic theory was brought forward, "that if they had to get the



disease they would get it anyhow," though this was urged, as a rule, without much appearance of sincerity. This readiness to gamble with Providence by running the risk of catching small-pox rather than submitting to the temporary inconvenience of a vaccinated arm is a phase of human nature too commonly met with to require more than a passing mention here. Objections of a purely frivolous nature were not infrequently to be reckoned with. More than one objector used the incontrovertible argument that the Founder of Christianity was not vaccinated, and that vaccination was not mentioned in The Bible; to which latter self-evident statement one large employer retorted to one of his workmen who made it, that neither was five shillings a day suggested in The Bible as a day's pay, but that one penny was, which he forthwith tendered to his inconsequential critic.

**Use of Calf  
Lymph.**

The extensive use of this preparation began in Gloucester towards the close of last year, when it was generally employed by private practitioners. Had they not done so it would have been practically impossible either to satisfy the scruples of those who objected to human lymph or to meet the demand for vaccination as it arose. The example of using calf lymph having been thus set, and its propriety so far established, the Guardians had no alternative but to follow suit, and to intimate when first making arrangements for meeting the emergency, as has been before mentioned, that calf lymph would be used in the case of all who desired it, which came to mean all.

It would be out of place to enter here into any discussion of the relative merits of calf and human lymph from a scientific point of view; it is sufficient to say that, irrespective of the considerations above mentioned, the Committee consider that the course thus adopted was fully justified, not only by the general practice of Germany and other countries in which calf lymph is generally used, but also by that of the Local Government Board itself, which maintains a special station for vaccinating with calf lymph, and supplies this material to public vaccinators when required. It was, however, necessary to obtain the formal permission of the Board for this departure from the regulations for public vaccination, as calf lymph, in the present state of its public employment, is, in the provinces, necessarily 'stored' lymph, and the Government have not yet seen their way, pending the publication of the Report of the Royal Commission, to sacrifice the advantage which human lymph presents, when employed by arm-to-arm vaccination, in regard to certainty of action, in consequence of the greater certainty of its freshness. This objection can only

be adequately met by the establishment of calf vaccine stations more generally throughout the country than is the case at present.

The cost of the work was very materially augmented by the adoption of calf lymph, but this was unavoidable, and there is the satisfaction of knowing that it was the most remunerative outlay incurred throughout the epidemic. The Committee employed several well-known brands of calf lymph, with results which seemed to indicate that there was no material difference in their value, when used under proper guarantees, so far as it could be tested by the character of the vesicles formed and the general immunity conferred alike by all of them.

It may not be out of place here to refer to the sentimental objection to the use of calf lymph, which obtained rather extensively, and embodied the idea that the lymph is a sort of concentrated extract of the animal from which it is taken, whether human or bovine, and that there is therefore a likelihood of the person into whose system it is introduced becoming impregnated in some way with the qualities of the animal from which it has been derived. This notion found vent in some cases in a distinct expression of repugnance to the operation on this ground. Some parents were unwilling that "a beast should be put into their children" or themselves, and a few pictured such terrible consequences to their children as that they might come to low and to browse in the fields like oxen.

It is difficult to deal seriously with a notion which, though ludicrously foolish, has prevailed amongst unthinking people from the time of Jenner downwards, and has been in some degree encouraged in an indirect way by those who oppose vaccination generally. But it may be pointed out, as a matter of fact, that the lymph is only the medium in which the special germ of the vaccine contagion develops, just as a tree does in the soil, and that there is no more reason for supposing that the transference of a small quantity of tissue-serum, with the germ in it, from one animal to another conveys anything that is specifically characteristic of the animal which supplies the lymph than that the transplanting of a shrub from a cottager's garden to a park would carry in the soil, accidentally attached to its roots, any infusion of the surroundings in which it had originally sprouted. It is the living germ which is the potent agent, not the inert fluid in which it floats. To the view of science, no less than of common sense, a healthy child and a healthy calf are in each case merely the medium for the culture of the vaccine germ, the products of which render each alike proof against the more serious infection of

small-pox, but do not otherwise affect the individuality of the organism in which the culture is effected.

**Unqualified Practitioners.** A very serious impediment to the work of the Committee was met with in the activity of enthusiasts of one kind or another, such as always push themselves forward in crises of this kind, each advocating his own special nostrum, not only as a safe and speedy cure for small-pox, but as a certain preventive against it. Modes of treatment which, within reasonable limits and under competent control, have for many years been well recognised by the medical profession as appropriate aids in the treatment of the disease, were thus invested with a protective power to which they have no claim, and the public were induced to subscribe money for administering them which might have been much more usefully expended. Many who were thus misled into relying upon them fell victims to the disease, and though in most cases disillusioned by their bitter experience, in some maintained their credulity even to death.

It is a striking and instructive comment upon this uprising of quackery that, with very few exceptions, the advocates of these delusions were active anti-vaccinators. In their desire to discredit vaccination and the medical profession at any cost, they welcomed with open arms anyone who professed to give any protection against small-pox other than by vaccination. By these means not only was the work of vaccination impeded but the infection was spread, partly by the constant visitation of infected houses by a variety of people for the purpose of treating the patients, and partly by the patients themselves being encouraged to go abroad before they were free from infection. The recourse which was had to legal proceedings in some cases probably did something to check this latter mischief, but there is no doubt that a great deal of harm was done in this way which the authorities were powerless to deal with.

The Committee would not be discharging properly the responsible duty imposed upon them if they closed this disagreeable aspect of the subject without referring to the countenance and active support given to these misguided enthusiasts by some few persons who, from the social position they hold and the influence they can exert, invested them with a prominence which they could not have otherwise obtained. It is one of the painful lessons which Gloucester has had to learn from its recent sad experience that there is no form of fanaticism or folly which may not, however egregious its absurdity, find encouragement at one time or another from apparently intelligent and well-meaning men.

Such persons seem altogether incapable of appreciating either the magnitude of their own assurance in "stepping in where angels fear to tread," or the grave responsibility which they incur in trafficking with human lives. It is through the influence thus banefully exercised by these persons that Gloucester has been gradually led into the hole into which it has fallen; that more than 400 of its inhabitants have been removed by death before their time; that more than four times that number have only escaped with their lives from one of the most noisome of diseases; and that a vastly larger number have, in one way or another, suffered in mind, body, or estate. It is a terrible responsibility to have incurred. Would that it it could be adequately brought home to those who have assumed it!

**Special Difficulties:  
"Successful"  
Vaccination.**

One of the most serious difficulties with which the Committee had to deal was that of estimating the efficiency of their work. At the very outset of their operations they found themselves face to face with the fact that not only is there no legal or authoritative definition of what "successful" vaccination is, but there is a great confusion of ideas as to the difference between "successful" vaccination and "effective protection." It may be taken as generally admitted that a person, whether child or adult, on whom a single characteristic Jennerian vesicle has been raised may be assumed to have been "successfully" vaccinated, the "success" consisting in demonstrating by this result that the system of the person so operated on was previously susceptible to the infection both of small and cow-pox, and in ensuring to it, as the result of the operation, a certain amount of protection against the former. A child or adult who is thus "successfully" vaccinated by a single vesicle is in the position of a man who should insure his premises against fire by a short policy. He obtains a certain amount of protection, probably sufficient for urgent needs, but if he were to suppose that the insurance would protect him against loss for life he would obviously delude himself, in a way which very few people do in matters of ordinary business, but which is common enough in the case of vaccination. If a person who is thus "successfully" vaccinated in a single spot is tested some time afterwards by a second vaccination it will probably be found that a fresh vesicle can be raised, not quite so characteristic as the first, and so on for three, four or even more vaccinations. In proportion as it would appear that the truly characteristic vesicles ceased to rise would the "success" of each operation gradually diminish, until the point of complete failure was reached; but, on the other hand, in the same proportion



would the permanence of the protection, and therefore the "efficiency" of the vaccination, increase. If, on the other hand, the four or five vesicles, instead of being raised one after the other, are produced at once, the "efficiency" of the protection conferred is proportionately increased, but the vaccination itself is not more "successful."

This distinction between "successful" and "effective" vaccination is not one of a merely speculative or scientific character; it lies at the foundation of the whole system of vaccination as a public sanitary safeguard. At present, the vaccinator, whether public or private, is only required to state in his certificate that A B has been "successfully" vaccinated by him, and this he can do, without any fear of prejudicial consequences to himself, if he has only raised a single vesicle and produced a single characteristic scar. He is not called upon to state how many vesicles or scars he has produced, or what is their aggregate area, though this consideration is of the essence of the matter, so far as the interests both of the person vaccinated and of the public at large are concerned. In a number of other matters of daily life in which it is desirable to brand the quality of the article produced, as a criterion of its value, we *grade* the results, so that all who are interested may have a ready means of appreciating its merits. Is there any reason why the same course should not be adopted in the case of the certificate of vaccination, and a basis thus afforded both for more accurate statistics than we can now obtain, as well as for the protection of the public against misconceptions and delusions to which they are now exposed?

**Ineffective Vaccination.** When the Committee commenced their operations they were much impressed with the importance of ascertaining, so far as was practicable, the value which might on these grounds be attributed to the work which had been carried on for some weeks before they were appointed. It is a matter of established experience that "panic" vaccination is always more or less indifferent in its character, because it is often hastily done and without that care and subsequent supervision which are essential to obtain the best results. In view of the fact that a good many thousand vaccinations, chiefly secondary, had already been effected, it was impracticable to inspect more than a limited proportion of them. With the object of meeting this requirement, it was decided to inspect a certain number of the cases which had been vaccinated officially, and Dr. Carter undertook this special work. It is not necessary here to enter into any details of the results of this inspection, beyond saying that ample evidence was obtained that a good deal of the vaccination which had been

effected was not such as to guarantee protection of a lasting character, though it was so far technically "successful" as not to justify its being altogether disallowed. The Committee therefore desire to urge strongly upon the consideration of the Government the expediency in any legislation which may ensue upon the presentation of the Report of the Royal Commission, of providing for a more precise form of certificate than that which is now required to be given, in the case both of primary and of secondary vaccination.

At ordinary times, when there is no particular stress upon the vaccination machinery, little difficulty is experienced in securing an inspection of the arm, either in the case of vaccination or re-vaccination, so as to ascertain whether the operation has been "successful" or not. But when people presented themselves by scores at the stations to be re-vaccinated, it was extremely difficult to ensure their presenting themselves again at the proper period for the purpose of having their arms inspected. The Committee have reason to think that many persons who are supposed to have been successfully re-vaccinated, in default of their having been inspected as they should have been, are really not protected at all. These are the cases which, when they have been subsequently attacked by small-pox, have been quoted by the anti-vaccinators as proofs of the uselessness of vaccination as a protection. All that they prove really is that at such a crisis as that through which Gloucester has lately passed there is sure to be a certain amount of hasty and more or less inefficient vaccination.

**"Fake" Vaccination.** The Committee feel it necessary also to allude to another source of inefficient vaccination, which has materially helped to swell the reports readily circulated by the anti-vaccinators of attacks after so-called "re-vaccination." As a result of the pressure which was so generally brought by employers of labour in the City to bear upon their *employés* to be re-vaccinated, a certain proportion of those who were thus, as they chose to consider, coerced into being invested with a protection which they did not appreciate, resolved to neutralise its effect so far as they could do so. The methods employed for this purpose were various. In some cases these unwilling victims of their employer's philanthropy sucked their arms, or had them sucked, as soon after the operation as they conveniently could. In others, they washed the incisions, or rubbed ointments or other applications into them; in others, they poulticed them. In fact they did their best, so far as their own ingenuity, or the suggestions of other malcontents like themselves, enabled them, to defeat the work of the vaccinator,



and, it is believed, in a considerable number of cases with success. With such hopeless perversity it is very difficult to deal, and it may be assumed with certainty that these recalcitrants would be pretty sure not to have presented themselves again voluntarily for inspection, and that their manœuvres were much facilitated by a laxity of inspection in the case of some establishments where this was not insisted on. It is amongst this class that a considerable proportion of the cases of small-pox occurring after re-vaccination have been traced, but even in these the attack appeared in some instances to have been distinctly modified by a small residuum of the protecting influence of the lymph which was not destroyed.

Although the Vaccinating Staff, acting under the instructions of the Committee, made such efforts as were in their power to ascertain how far re-vaccinations, which were alleged to have been recently performed were successful or not, it was impracticable to do more than inspect a small fraction of them without keeping the machinery at work for a length of time and at a cost which would have been out of proportion to the results obtained. But it can be positively asserted that in not one of the cases of small-pox after alleged vaccination or re-vaccination before exposure to infection which have been brought under the notice of the Committee was any sufficient proof obtained that the vaccination or re-vaccination had been "efficient" as defined above.

**Coercive Measures.** When it became evident that the unprotected had been at length reduced to a comparatively small number of children whose parents would not have them vaccinated, and to a somewhat larger number of adults upon whom no further impression in inducing them to be re-vaccinated could be made, the Committee decided to end the special facilities for voluntary vaccination which they had, with so much cost to the ratepayers, for some weeks offered, and to invoke, in the case of defaulting parents, the coercive powers of the law, which the Board of Guardians had by their resolution of March 24th last decided to again put into force.\*

**Classes of Objectors to Vaccination.** As a great deal of misconception prevails as to the nature and extent of the objection against vaccination which is supposed to exist in Gloucester, and no doubt also elsewhere, it seems desirable that the Committee should state the conclusions to which their expe-

\* "That the Vaccination Officers be and are hereby directed to carry out the provisions of Art. 16 of the General Order of the Local Government Board of 31st Oct., 1874, relating to Vaccination, in accordance with the terms of the resolution passed by this Board on 19th Sept., 1876. This resolution was carried by a majority of 31 votes to 22 in a meeting at which 53 were present out of a total of 63 Guardians.

rience has led them in regard to this point. There are, unquestionably, a certain number of parents who entertain a strong and conscientious objection to the vaccination of their children, upon grounds which they think satisfactory, however insufficient they may appear to the great majority of their fellow-citizens. How far legal compulsion is justifiable or expedient in such cases may be open to question. Without entering upon a discussion which would unduly lengthen this Report, it is sufficient here to point out that the right of the State to coerce individuals into action which is considered by the majority beneficial in the public interest, or to restrain them from action which is similarly considered to be prejudicial to the public interest, is established upon such substantial precedents that it cannot be disputed. If the plea of "conscientious objections" could be successfully urged as an excuse for not obeying the law, it is certain that the framework of society would soon be shaken to its foundations. The questions, therefore, as to the extent to which it is desirable to apply coercion, and as to the modes in which it should be applied, merely involve considerations of expediency, and not of moral or legal right.

**A common fallacy exposed.** There is one very common argument used by the opponents of vaccination to which it seems appropriate to refer here. It is to this effect: "let those who believe in vaccination protect themselves and their children; why should we who conscientiously disbelieve in it be compelled to do so? Those who are vaccinated will be, so they think, protected; let them be satisfied with that and leave us alone: it is only we and our children who will suffer if we are attacked with small-pox, and we are quite willing to run the risk."

Now, in the first place, the law, which is the embodiment of the intelligence and humanity of the majority of the community, neither allows people to attempt to kill themselves with impunity, nor does it allow parents to trifle with the lives of their children, in other matters than vaccination, as the so-called "Peculiar People" have more than once had brought home to them. But, irrespective of these general considerations, if there is one thing more than another that the recent experience of Gloucester has demonstrated, it is the futility of the above-mentioned assumption. If only a very small proportion of the children who have been born in or introduced into Gloucester during the last ten years had been allowed to escape vaccination, the recent epidemic would never, in all human probability, have occurred. Even if it had, the persons attacked by it would have been, as in most of

the epidemics which have happened in other parts of the United Kingdom during the past half century, and as was the case at the outset of it, those who had been vaccinated in infancy, but who had more or less lost their protection through lapse of time. Without the means of efficiently isolating such cases directly they are discovered an epidemic may soon be established in any populous district; but it would need great apathy or great mismanagement on the part of the local authority for it to get beyond control, as the Gloucester epidemic suddenly did.

What in Gloucester fanned with startling rapidity a smouldering fire into a sudden blaze was, as has been before stated, the accident by which the infection was sown broadcast amongst a number of unvaccinated children. It became impracticable then to control the epidemic, and we found ourselves face to face with a raging pestilence, against which the community as a whole were, in a degree, even less protected than they were in the times before Jenner. For then, as abundant evidence proves, an epidemic of small-pox was mainly confined to children, for the simple reason that the bulk of the older population had had the disease when young, and though they had only escaped from it with disfigured faces and often with the loss of sight, they at any rate enjoyed a pretty effective protection for the rest of their lives. But in Gloucester a considerable proportion of the adult population were not so effectually protected, for they had lost more or less of their infantile protection and were living in "a fool's paradise," either of disbelief in the need of protecting themselves again or of procrastination in so doing, from which they were rudely awakened when the pestilence laid its grip suddenly upon them.

If the mortality and suffering and pecuniary loss which the epidemic has imposed upon Gloucester could have been confined to the opponents of vaccination the rest of the community would probably not have been greatly disturbed. But this was impossible, and those who have had to pay the piper for the tune to which they have unwillingly been compelled to dance have some reason if they decline to face this particular "music" again.

It is, therefore, a fallacy for the opponents of compulsory infantile vaccination to assert that it is only they and their children who will suffer for their folly. We know by the best of all evidence that this is untrue, and that they cannot disassociate themselves, as they profess to think, from the rest of the community, who must suffer for their shortcomings, and who, consequently, are justified, in this as in other matters, in

compelling a minority, however conscientious they may allege their opposition to be, to conform to laws which are made for what the majority consider the general good. It has needed such an experience as that of Gloucester to enforce this elementary truth, and it will be some compensation to those who have had to pay for it so dearly if it should be the means of protecting others from a similar catastrophe.

Apart, however, from the class of assumably conscientious and, in a degree, consistent objectors to vaccination, who have some sort of justification on which they found their opposition to it, and who are really a comparatively small one, there is a far larger body of recalcitrants who have no reason whatever to give beyond the assertion that "they do not hold with vaccination." And there is a still larger class who entertain no particular objection to vaccination itself, but who simply refrain from having their children vaccinated because they have not had the danger of leaving them unprotected brought forcibly before them, and because they do not care to be compelled to do what other people are allowed to escape from doing.

**Converting  
effect of the  
Epidemic.** For many years past small-pox has been so largely a disease of adult life, even when epidemic, that, as has been just stated, it has required such an experience as Gloucester has gone through to convince many persons that it is still, as it was before the time of Jenner, preeminently the scourge of childhood, wherever circumstances expose an unprotected infantile population to the chances of its attack. That experience soon converted many a doubter or waverer in Gloucester, and sufficiently accounts for the readiness with which the large majority of parents presented their children for vaccination directly the outbreak in connection with the Widden Street School and the extension of the disease amongst the unprotected juvenile population which rapidly followed it, together with the high mortality by which it was accompanied, opened their eyes to the true nature of the risk they were imposing on their children. But even after this convincing demonstration there were still a number of parents who, under one excuse or another, refrained from making up their minds, and it needed the stronger conviction that they would be summoned if they did not do so to bring them to a decision.

It was in view of this state of things that the Vaccination Committee felt bound to call into operation the power as well as the duty which the law has entrusted to Boards of Guardians, and to draw from its scabbard the sword which has lain rusty in it for so many years. The Board of Guardians



had two months previously issued and widely distributed a notice (Appendix M) calling the attention of defaulting parents to the legal provisions of the Vaccination Acts, and appealing to them to spare the Board the necessity of putting those provisions into force.

**Good effect of Prosecutions.** The issue of a definite threat to prosecute at once brought in a considerable number of defaulters, whilst the actual issue of the citation was in others also followed by submission. The prosecutions which followed have had an equally salutary effect, by showing on the one hand that the Committee had determined to carry out the decision of the Guardians, and, on the other, that there is a very large proportion of defaulters who only want to be submitted to a very moderate pressure to dissipate any antipathy which they may entertain to the vaccination of their children.

**Effect of In-direct Coercion.** A similar remark may be made in the case of re-vaccination. A considerable proportion of those who have renewed their infantile protection during the past six months have done so under pressure of some kind. In some cases they have been induced to submit to the operation by fear of the risk of catching the disease thus brought so near to them. In others their submission has been due to pressure exercised by their employers.

**By Employers.** Ample evidence will be found in the Appendix of the beneficial effects of this pressure in protecting large bodies of *employés* against the disease; and reference has already been made to the contrast in this respect between the action of the Midland and Great Western Railway Companies. Whilst a large number of *employés* have thus had reason to feel grateful that they were induced to be re-vaccinated, in some cases against their inclinations, many others have had equal reason to regret the fact that similar pressure was not used in their case, and they and their friends in many cases have not failed to express themselves to that effect.

**Through the Schools.** The public elementary schools, the first of which (Widden Street) was closed on Feb. 23, and the others at different periods up to May 22, were re-opened on June 1st to all children who had been vaccinated. A great deal of outcry was made by the anti-vaccinators against this restriction, which was not only a proper one in the interest of the schools themselves but of the unvaccinated children, for it exercised a healthy influence in stimulating vaccination. The likelihood of being summoned and fined and the certain inconvenience to themselves and the detriment to the children brought many a parent to view in a new light a matter which they had been accustomed to consider as settled once and for

all by their own private inclinations, and swelled the vaccination returns at a time when they were beginning to fall off. Many of the more noisy defaulters frankly declared their intention of not having their children vaccinated until they received a summons; others invited prosecution, and named large sums they were prepared to pay in support of their convictions. The sequel in one instance was instructive. A husband, who had expressed his intention to fight the case by the aid of £25 of his own money and £25 which he alleged had been promised him by the Anti-Vaccination Society, was ultimately represented in Court by his wife, and was mulcted only in 13/6 costs, whereon she left the Court declaring their inability to pay even this amount!

**Intention to  
uphold the  
Law.**

The Committee have, since the closure of the Vaccination Office and the suspension of the special vaccination machinery created to meet the needs of the epidemic, occupied themselves in gradually clearing up the arrears of primary vaccination which have accumulated during the last ten years. The great majority of children now resident in Gloucester have been more or less effectively protected by the wholesale vaccination carried on during the epidemic. But the difficulty is to trace the whole of these cases individually, so as to be sure that the provisions of the law have been complied with and the interests both of the individual and of the community have been adequately protected. The Committee are having the whole of the uncertified cases gradually sifted, and they expect at no distant date to bring the juvenile population of Gloucester into the same position in regard to vaccination as they would be in if the resolution of 1887 had never been passed.

In Appendix N will be found a statement of the number of children born in Gloucester during the ten years ending Dec. 31, 1895, and of the ways in which their vaccination history has been approximately compiled. Absolute accuracy in such a matter is impracticable, but it is believed that the record given is sufficiently accurate, to the 30th June, the date at which it was compiled, to give a fairly correct idea of the present condition of that large number of children.

**General result  
of the  
work done.**

In Appendix O will be found the general returns of vaccinations and re-vaccinations, from all sources, effected during the epidemic. Nominally the return covers the returns received from January 1st to August 8th of this year; but a certain number of the returns include vaccinations and revaccinations performed by private practitioners during December, 1895, when the demand first became acute, though it is impossible to discover exactly how many. The return



includes also the outlying villages of the Gloucester Rural District, and the suburbs of Gloucester, as well as the City proper. It thus appears that out of an estimated population of about 52,000, at least 36,000 have been induced to accept the protection of vaccination, either in their own persons or in those of their children.

The balance, of whom no record is given, is made up of a variety of different elements. Many are elderly persons who refused to be re-vaccinated because they believed themselves to be proof against small-pox from the fact of being protected by their age against the risk of infection. In connection with which assumption it is well to note that a trifle over 15 per cent. of the cases which have occurred during the epidemic have been over 60 years of age. A second category is that of persons who had previously had small-pox, and for that reason considered themselves to be protected. The Committee are not in a position to state exactly how many of this class were actually attacked, but they have reason to believe that the number is very small. Most of those who thus enjoyed immunity obtained it during the epidemic which prevailed in Gloucester and its neighbourhood in 1873. A third section includes those who, whether as children or adults, were considered to be in a condition of health in which vaccination was at the time not desirable. The residue is made up of children who have not reached the age of compulsory vaccination, persons who were temporarily absent from Gloucester, vaccinations unaccounted for (by the few medical practitioners who sent in no or imperfect returns), and, probably the largest body of all, the active opponents of vaccination and the apathetic, with their families, who have not yet been vaccinated or re-vaccinated.

**Need for dissemination of information.** The Committee have to thank the Jenner Society for a large number of papers and pamphlets, designed to meet the objections against vaccination, which were placed at their disposal by the Executive Committee of the Society, and were freely distributed throughout Gloucester during their earlier operations. It is clear that if the efforts of the opponents of vaccination are not to be allowed to go uncombated, as has been so largely the case hitherto, some such agency as that of the Jenner Society will be needed to successfully carry on the campaign. For, however weighty official statements of the statistics and facts in favour of vaccination, such as those issued by the Local Government Board, by Sanitary authorities, or by professional journals, may be, it requires an activity, promptness, and flexibility which is not generally found in official

machinery to meet an agitation such that has been for some years carried on by the organised efforts of the Anti-Vaccination League. It is by a widespread diffusion of such evidence as the recent experience of Gloucester offers as to the protective value of vaccination that the misstatements and fallacies of anti-vaccinators can be best counteracted, for it has been an object lesson which nothing but the most firmly rooted prejudice could fail to comprehend.

The Committee also desire to thank the medical practitioners of Gloucester for the information afforded them as to the private vaccinations which they have performed, returns having been received from the great majority of them. If these have not in all cases been as complete as could be desired, it is to be attributed to the disuse into which vaccination had fallen, leading to the disregard of the proper records, and also to the pressure of work, caused by the sudden rush of a large number of applicants, conducing to the same result. The Committee also desire to express their thanks to Dr. Campbell, Medical Officer of Health for the City, for the readiness with which he allowed his records to be consulted in connection with their inquiries.

In the second portion of the Appendix will be found statistics of the recent epidemic, so far as they are calculated to illustrate its magnitude and duration, and its relations to vaccination.

#### **Conclusion.**

The third portion contains evidence from a large number of persons occupying a prominent and responsible position, as heads of public institutions, employers of labour, and others who have been in close contact personally with the epidemic. From the general body of evidence which the Report thus contains it will be clear to every intelligent and unprejudiced person that whatever the views entertained by a considerable number of persons in Gloucester may have been up to the end of 1895 as to the uselessness of vaccination as a protection against small-pox, there can be no doubt now that the vast majority of the citizens are convinced of the error of the course pursued by all classes in neglecting vaccination as they did up to that date. Probably no record exists of so rapid, so extensive, and so momentous a conversion on any matter not directly connected with a question of religious belief. Gloucester, which in the year 1892 headed the record of badly vaccinated communities in England and Wales, showing a percentage of 86.9 of children who had been born during the year and were not accounted for in the vaccination returns, is now, in regard both to its infantile and adult population, probably one of the best vaccinated towns in the Kingdom. But at what a cost has this conversion been

**A Great Conversion.**

achieved! The Committee can only express the fervent hope that the result of their labours and of the efforts of all those by whom they have been so cordially assisted in effecting this great conversion may revive permanently the confidence which not only Gloucester but Gloucestershire for so many years exhibited in the great discovery of her illustrious son, the centenary of which has been recently commemorated from one end to the other of the civilised world with an enthusiasm which is sadly in contrast with the treatment it has received in the home of its birth.

*Signed,—*

*Committee :*

JAMES CLARKE, *Chairman*.  
CHARLES GOUGH.

JNO. WM. JEENS.  
JOHN JENNINGS.  
F. C. WORKMAN.

FRANCIS T. BOND, M.D., *Superintendent of Vaccination*.  
ERNEST CHRISTISON CARTER, M.D., *Deputy do.*

*August, 1896.*

P.S.—The Committee desire to place on record the great indebtedness, not only of themselves but also of the Board of Guardians and the public, for the very able and efficient manner in which Dr. Bond organized, and Mr. Stanway carried out—in both cases gratuitously—the work of the Committee in this very important matter.

They also desire to record their satisfaction with the capable manner in which Dr. Carter performed the responsible duties he undertook; and their thanks to Mr. L. G. H. Mayer, Superintendent Registrar, for his very useful and willing assistance, and for gratuitous permission to inspect his registers.

# APPENDIX TO REPORT.

## I.—Statistical and other Documents illustrative of the Report.

### APPENDIX A.

#### GLOUCESTER SMALL-POX EPIDEMIC.

Result of the " House-to-House Visitation " by the Assistant Vaccination Officers ; commenced April 27th, concluded May 15th, but subsequently revised.

District	Information obtained by the Assistant Vaccination Officers			
	Not at home	Particulars refused	Information received	
	Houses	Houses	Houses	Inmates of same
	A	B	C	D
1	54	7	968	4562
2	55	7	807	3520
3	4	4	436	2072
4	35	14	823	3568
5	32	19	429	1924
6	23	5	501	2265
7	18	4	801	3792
8	39	8	1001	4547
9	31	11	969	4735
10	14	6	497	2393
12	47	8	720	3274
	352	93	7952	36652
<i>Public Institutions :</i> Wotton County Asylum				658
Prison ..				97
Infirmary ..				117
Workhouse..				250
Police Station ..				32
Total for Gloucester City proper ..				37806
District	Not at home.	Particulars refused.	Information received.	
	Houses	Houses	Houses	Inmates
SUB-URBAN GLOUCESTER : South End	11	6	194	988
East End	13	11	178	784
	17	—	372	1772

## SUMMARY OF GLOUCESTER CITY.

The Number of the Inhabitants of 7952 Houses as per columns C and D were.. .. .	36652
giving an average of 4·60 to each House.	
Add the Inmates of the Public Institutions .. .. .	1154
Population accounted for ..	37806
The Number of the Houses from which no information was received, as per columns A and B, is 445; and if the Inhabitants are taken on the average of those seen, <i>viz.</i> , 4·60 to each House, it would give a further Population of .. .. .	2051
Making the Inhabitants of the City proper to be ..	39857

## APPENDIX B.

## CITY OF GLOUCESTER.

At a Meeting of the Medical Profession of this City, convened by Dr. Batten in consequence of an official communication from the Sanitary Committee of the City Council with reference to the epidemic of Small-pox, held at the Guildhall, on Thursday, the 16th day of January, 1896.

Present: Dr. Batten in the chair, and 21 other medical men.

RESOLVED:—

That this Meeting of the Medical Profession of the City of Gloucester, in response to the courteous invitation of the Urban Sanitary Committee for advice and assistance in the present serious outbreak of Small-pox, desires to express its readiness to assist the Sanitary Authority and its *unanimous* opinion:—

- (1) That the accommodation at the Hospital for Infectious Diseases should be at once increased; and that the plans should be such as will admit of still further extension, if necessary, so that every case of small-pox may be removed from the home to the Hospital without delay.
- (2) That we have *no hesitation whatever* in expressing our belief that "successful" vaccination in early life and re-vaccination at a proper interval afterwards is an effective and the only available means of protection against an attack of small-pox, and that it is the duty of all parents to provide such protection for their children.
- (3) That the Guardians be urged to comply with the provisions of the Vaccination Acts and the General Order made by the Local Government Board thereunder, and in particular with Article 16 of such Order; and also to instruct the Vaccination Officers to fully carry out their duties under the said Acts and Order.
- (4) That it is desirable that steps be taken by a house-to-house visitation and (with the co-operation of the School Authorities) by Examination of the children attending the Elementary Schools, to prepare lists of unvaccinated persons with a view to insure their prompt vaccination.
- (5) That in view of the intimate relations of the City and Rural Districts, especially in their suburban connections, it is expedient both in regard to efficiency and economy that the Urban Sanitary Authority and the Rural District Council should combine to provide such permanent accommodation as may be necessary to meet any future outbreak of Infectious Disease.



RESOLVED ALSO:—

That copies of these resolutions be sent to  
 The Gloucester Urban Sanitary Authority  
 The Guardians of the Poor of the Gloucester Union  
 The Rural District Council  
 The Local Government Board  
 The Local Press, and  
 The Medical Press.

(Signed) RAYNER W. BATTEN,

Chairman.

N.B.—An expression of adherence to the above resolutions was subsequently received from two or three other members of the medical profession who were unavoidably prevented attending the meeting. So that the resolutions may be taken as expressing the unanimous opinion of the Medical Profession of Gloucester.

## APPENDIX C.—(COPY OF POSTER).

### SMALL-POX.

In view of the continued spread of the disease of small-pox in this City, the Guardians of the Gloucester Union earnestly recommend the parents of all un-vaccinated children to obtain their immediate vaccination; and for this purpose, Dr. J. R. Bibby, the Public Vaccinator, will attend every Saturday at the Old Crypt Schoolroom, Southgate Street, at 2 30 p.m., and will also be prepared to vaccinate, free of charge, any children, and re-vaccinate any adults, at his residence, 12, Clarence Street, Gloucester, between the hours of 9 and 11 a.m. daily. The vaccination will be with calf lymph if desired.—*Poor Law Offices, Gloucester, January 16th, 1896.*

## APPENDIX D.

*Private Circular to Employers.*

### SMALL-POX.

Having regard to the very serious consequences resulting from the prevalence of small-pox in this City, the Sanitary Committee of the Corporation request employers of labour to urge upon their employees the extreme importance of vaccination.

The Committee are giving every attention to General Sanitary precautions, but are advised that vaccination and isolation are the only reliable means of checking the epidemic; and they are assured that if the vaccination of children and re-vaccination of adults were promptly and thoroughly carried out, there is every reason to hope that the disease would be at once checked and very soon stamped out.

In addition to the distress occasioned to the families of those afflicted, the epidemic is very seriously affecting the trade and welfare of the City; and unless promptly checked, it may at any moment interfere with and possibly result in the closing of various works and other centres of employment, just as it has already necessitated the closing of several of the Public Elementary Schools.



Although most anxious not to cause unnecessary alarm or to give undue publicity to a state of things [which everyone must regret, the Sanitary Committee feel it their duty to ask employers of labour to *privately* lay these facts before their employees and urge them to assist the Sanitary Authority to check the epidemic by at once arranging for the vaccination of the children and the re-vaccination of themselves and other adults in their respective households and by inducing their friends and neighbours to adopt a similar course. It may be well to intimate that all persons may be vaccinated (with calf lymph if desired) without any charge.

The Committee trust that all citizens, including those who hitherto have been opposed to vaccination, will, under existing circumstances, give due consideration to this strong and unanimous recommendation, especially as it is supported by the unanimous opinion of all the medical men in the City.

Signed by direction of the Sanitary Committee,

GEORGE SHEFFIELD BLAKEWAY,  
Town Clerk.

JOHN CAMPBELL, M.D.,  
Medical Officer of Health.

Guildhall, Gloucester,  
13th March, 1896.

## APPENDIX E.

Extract from a letter sent by the Local Government Board to the Corporation of Gloucester, a copy of which was forwarded by the Corporation to the Board of Guardians, and read at a meeting held in March, 1896.

"The Board are advised that under existing circumstances *the only means* that can be relied on to control the further diffusion of small-pox will be the *immediate organisation of a general system to procure the prompt vaccination* of all unvaccinated persons under 14 years of age, and the re-vaccination of all persons over 10 years of age who have been primarily vaccinated in infancy.

## APPENDIX F.

Composition of Districts into which the City and suburbs of Gloucester were divided for purposes of inquiry and vaccination.

### URBAN DISTRICTS.

DISTRICT No. 1. (a) Linden Road and the City Boundary, (b) Gloucester and Berkeley Canal, (c) Railway Line crossing Bristol Road, (d) Stroud Road and Tredworth Road.

DISTRICT No. 2. (a) Park End Road and part of Park Road, (b) Good-yeer Street and Ryecroft Street, (c) Barton Terrace and High Street, Tredworth, (d) Tredworth Road and part of Bristol Road.

DISTRICT No. 3. (a) High Street and Barton Terrace, Tredworth, (b) Upton Street and part of Lower Barton Street, (c) Swindon Branch of G.W.R., (d) Portion of Tredworth Road.

DISTRICT No. 4. (a) Portions of Park End and Park Roads, (b) Barton Street from Railway Crossing, Lower Barton Street, (c) Goodyer, Ryecroft, and Upton Streets.

DISTRICT No. 5. (a) Derby Road, Worship Street up to G.W.R., (b) G.W.R. to Lower Barton Street, (c) Lower Barton Street.

DISTRICT No. 6. (a) Midland Railway from Barton Street Crossing to top of Worship Street, (b) Barton Street, (c) Derby Road and Worship Street.

DISTRICT No. 7. (a) Barton Street from Railway Crossing, and Eastgate Street, (b) Northgate Street, London and Barnwood Roads to the City Boundary, (c) thence to Cheltenham Railway, (d) Railway to Barton Street Crossing.

DISTRICT No. 8. (a) Northgate Street, London Road, Barnwood Road to Boundary, (b) Worcester Street and Kingsholm Road, (c) City Boundary between (a) and (b).

DISTRICT No. 9. (a) Westgate Street, (b) part of Northgate Street, (c) Worcester Street, Kingsholm Road, (d) City Boundary between (a) and (c).

DISTRICT No. 10. (a) Southgate Street and part of Bristol Road to railway crossing, (b) Thence to Gloucester and Berkeley Canal and Road round Llanthony Priory, (c) Bank of Severn, (d) Westgate Street.

DISTRICT No. 12. (a) Southgate Street, part of Bristol Road, and Stroud Road, (b) Park End Road and part of Park Road, (c) Barton Street and Eastgate Street.

#### SUB-URBAN DISTRICTS.

DISTRICT No. 11. (a) Linden Road, (b) Gloucester and Berkeley Canal, (c) Tuffleigh Avenue.

DISTRICT No. 13. (a) Swindon Branch of Great Western Railway, (b) Twyver Brook, outside City boundary.

Where names of streets are mentioned as boundaries of different districts, one side was counted as belonging to one and the other belonging to the other district; but it was found afterwards that it would have simplified the work had the bounding streets been allotted entirely to one or other district.

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## APPENDIX G.—(COPY OF HANDBILL).

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### HOW TO END THE SMALL-POX.

The Board of Guardians are advised by Her Majesty's Government that the only way of quickly ending the present deplorable outbreak of small-pox in Gloucester, which is causing such terrible loss of life and money to the City, is to secure the general vaccination of its inhabitants with as little delay as possible. The Board, therefore, feel it their duty to take every step in their power to obtain this end, and they are advised, as the first means of so doing, to make a

#### VACCINATION CENSUS.

To do this they have appointed a staff of *Vaccination Officers*, to visit each house in the City, and they earnestly appeal to their fellow-citizens to aid them by giving these officers full and exact information, when applied to by them, so that the vaccination of those who are not already vaccinated may be carried out with as little delay as possible.

The Guardians further appeal to those who have hitherto opposed vaccination to consider the grave responsibility they are incurring in continuing so to do, and they implore them to follow the good example already set by so many of their own persuasion, who have submitted *both themselves and their families* to the operation *for the public good*.

BY ORDER.

## APPENDIX H.

## GLOUCESTER UNION.

It is the duty every evening of the Assistant Vaccination Officer to—

(a) Furnish lists to the Vaccination Officer of the district of all unvaccinated children under 14 years of age discovered by him during the day; and

(b) Similarly to the Medical Officer of Health lists of all persons found to be actually suffering from small-pox.

District No. 1.

Street, Chepstow, No. 12. No. 1.

Suppliers, John Jones and William Brown.

## 8 AND 6 INMATES.

Name	Age	Vaccinated, and if recently, by whom	When	Re-Vaccinated, and if recently, by whom	When	Had Small-pox?	If so, when
Jones, John	45	V.	As infant	Yes (Bibby)	June 3	No	April, 1896
" Mary	42	V.	do.	No	and refuses	No	
" Charles	16	No		No		Yes	
" Henry	14	V.	As infant	Yes (Bibby)	June 10	No	
" Mary	12	V.	do.	do.	do.	No	
" Edward	10	V.	do.	do.	do.	No	
" Jane	8	V.	do.	No		No	
" Clara	6	No		Willing to be	done	No	
Brown, William	30	V.	As infant	No	willing to be done	No	April, 1896
" Sarah	29	V.	do.	No	refuses	No	
" Joseph	10	No	} Mother	refuses to have them done		No	
" James	8	No				No	
" Fanny	6	No				No	
" Robert	4	No				Yes	

Signed, R. SMITH.

## APPENDIX I.

Chepstow Street.

DR. MOORE.  
District No. 1.

No. of House and Name of Person	Particulars	Vaccinator's Remarks
12 Jones, Mary refuses	Wife	Re-vaccinated her May 2nd, 1896
do. Clara willing	Child of 6	Vaccinated her do.
14 Brown, William willing	Husband	Re-vaccinated him May 3rd, 1896
do. Sarah refuses	Wife	Will not be done.
do. Joseph never V.	Child of 10	} Mother still refuses and cannot persuade her*
do. James and mother	do. 8	
do. Fanny refuses	do. 6	

Initials, R.D.M.

\*These three cases were then transferred to "Primary Refusals Book," for the Vaccination Officer to take such steps as may be necessary.

N.B.—In the above two illustrations of the forms of return employed, two returns have in each case been included in one form, for the sake of economising space.

## APPENDIX K.

Vaccination Enquiry Office,  
Station Road,  
Gloucester.

April 28th, 1896.

Dear Sir,

In order to expedite the work of house-to-house Vaccination, it has been suggested that a few ladies or gentlemen should be asked to accompany the medical men engaged in this work, and who are nearly all unacquainted with the town.

Personal knowledge of the district would lead to a great economy of time and labour, while a little persuasion would undoubtedly help greatly in certain cases.

We shall be glad to know of any who could help us in this, and so hasten on the end of the epidemic.

FRANCIS T. BOND, M.D.,  
On behalf of the Vaccination Committee.

## APPENDIX L.

VACCINATION ENQUIRY OFFICE

STATION ROAD (next to Creamery),

GLoucester, *May 2nd, 1896.*

Dear Sir,

The Guardians are rejoiced to see that the steps already taken to prevent the spread of small-pox in this City have been followed by a diminution in the number of cases of the disease.

There is still, however, a large number of adults who have not availed themselves of the offer of Re-vaccination free of charge.

Until this is done the abatement of the epidemic must be necessarily slower than it would otherwise be. The Guardians therefore desire your cordial co-operation in securing the Re-vaccination of the entire adult population.

If you would be good enough to answer the first or all of the annexed questions, and return them here, you would greatly oblige us and lighten our work.

FRANCIS T. BOND, M.D.,

Superintendent of Vaccination.

- (1) How many of the hands in your employ have not been re-vaccinated?
- (2) Are you willing to have the operation performed on your premises in the case of those who have not availed themselves of the Guardians offer?
- (3) When would you be willing to see one of our Medical Staff?



## APPENDIX M.—(COPY OF BILL).

## PUBLIC NOTICE.

## VACCINATION.

To Parents and Persons having the Custody of Unvaccinated Children under the age of 14 years.

The Board of Guardians of the Gloucester Union has resolved to carry out as quickly as practicable, the provisions of the Vaccination Acts (30 & 31 Vict., cap. 84, and 34 & 35 Vict., cap. 98) and to secure as far as possible the vaccination of all unvaccinated children under the age of 14 years.

The Guardians desire to avoid the necessity for taking legal proceedings to enforce the Acts referred to, and they therefore appeal to the above-named to immediately take steps to obtain the vaccination of their children, as the only means of promptly stamping out the present epidemic of small-pox.

Notice of the various public vaccinators and stations, has already been made public, and the Guardians trust that this appeal will meet with a ready response—otherwise the law will be carried out.

BY ORDER.

Poor Law Offices,  
4th April, 1896.

## APPENDIX N.

Record of children born in the Gloucester District during the 10 years ending Dec. 31, 1895, and of their relations to Vaccination.

Total births (1)	..	..	..	..	..	..	15682
Children under 10 years of age vaccinated prior to Jan. 1, 1896 (2)							2378
"    "    "    since    "    (3)							8400
"    "    dead to date (4)				..	..		3176
"    "    gone away from Gloucester (5)				..	..		849
"    "    who have had small-pox and have recovered (6)	..	..	..	..	..	..	523
Children known to be unvaccinated (7)				..	..	..	209
"    under three months old (8)				..	..	..	200
							15735
							15682
From above	..	..					
Balance being surplus	..						53

(1) Obtained from the Registers of births.

(2) " " Registers of the Vaccination Officers.

(3) This number includes vaccinations registered by (a) the special staff appointed by the Board of Guardians; (b) the ordinary public vaccinators and their personal assistants; (c) the staff employed by the City Council, (d) the medical officers of the various public institutions; (e) the other medical practitioners of the city. In the case of the first four of these categories the numbers may be relied on as nearly exact, but in the last the number is only approximate, some of the medical practitioners not having kept an exact record of their primary vaccinations.

- (4) Obtained from the Registers of deaths.  
 (5) " " Vaccination Officers.  
 (6) " " Medical Officer of Health for the City.  
 (7) " " record of the house-to-house inquiry made by the Committee.  
 (8) Obtained from the Registers of births.

There is, in addition to the uncertainty as to vaccinations performed by private practitioners, another element of uncertainty arising from the children now under 10 years of age, who have come to reside in Gloucester within the last 10 years. Their number cannot be estimated with any approach to accuracy, and would swell materially the balance of 53 appearing above.

## APPENDIX O.

### GLOUCESTER BOARD OF GUARDIANS.

*Return of Vaccinations and Re-Vaccinations from January 1st, 1896, to August 8th, 1896, as ascertained from all known sources.*

Vaccinators	Primary	Re-Vaccinations	Total
Vaccination Enquiry Office Staff ..	756	1098	1854
Public Vaccinators .. ..	5537	12435	17972
Corporation Staff .. ..	424	956	1380
Private Practitioners* .. ..	1827	11875	13702
	8544	26364	34908
Number of children, 10 and under, } who are stated to have been } vaccinated in infancy }	1072		1072
	9616	26364	35980

\*From one Medical Practitioner no returns at all have been received, nor have any been received by the Committee from Private Practitioners generally since June 13th.

II.—*Evidence as to the Protective Value of Vaccination derived from a consideration of the statistics as to the number of persons attacked during the epidemic, their ages, and the fatality of their attacks.*

The general character and statistics of the recent epidemic will be properly dealt with by the Medical Officers of Health of the Gloucester Urban and Rural districts in the reports on the subject which they will make for the information of the Local Government Board, and by Dr. Coupland in the Report which he will make to the Royal Commission on Vaccination on the result of his inquiries in Gloucester. But, in order to give the reader of this Report some idea of the character, magnitude, and duration of the epidemic, it may be mentioned that from the month of May, 1895, when, as stated in the body of the Report, the first case of small-pox occurred in one of the suburbs of the city, until the last week in July, 1896, when the epidemic ceased, the total number of cases of small-pox notified in the city and suburbs of Gloucester was 2036. Of this number 1981 were in the city proper, and 55 in the two suburbs referred to in the Report as districts 11 and 13. Of the 2036 cases thus notified, only 730 were received into the Isolation Hospital, the remainder being treated on the premises on which they occurred.

The total number of deaths registered was 443, or 21·2 per cent of the attacks.

The number of deaths amongst patients admitted into the Isolation Hospital was 199, or 27·2 per cent of the cases.

The number of deaths amongst patients not admitted to the Hospital was 244, or 18·6 per cent of the total number thus treated.

Of the 199 deaths of patients admitted into the Hospital no less than 125, or 62·9 per cent., were unvaccinated children under 10 years of age.

The relations of the epidemic to vaccination are generally indicated by the following tables, which deal with the whole of the cases notified in both the city and suburbs:—

		Under 10 years.	10 to 20 years.	20 to 30 years.	30 to 40 years.	Over 40 years.	Total.
Attacks	Vaccinated	25	271	373	287	272	1228
	Unvaccinated	688	51	18	14	10	781
	Uncertain	1	2	8	9	7	27
		714	324	399	310	289	2036
Deaths	Vaccinated	1	6	25	34	48	114
	Unvaccinated	279	15	9	9	5	317
	Uncertain	—	1	4	4	3	12
		280	22	38	47	56	443

Apart from the question of age-incidence, the fatality in vaccinated and unvaccinated cases respectively was as follows:—

	Unvaccinated.	Vaccinated.	Uncertain.	Total.
Attacks	781	1228	27	2036
Deaths	317	114	12	443
Proportion of Deaths to Attacks	40·5 per cent.	9·2 per cent.	44·4 per cent.	21·7 per cent.

In interpreting these numbers, and in order to appreciate properly the story they tell, and to avoid a very common fallacy, it is necessary to bear in mind that the term "vaccinated" refers only to vaccination done in infancy or, at any rate, some considerable number of years before the period of the recent epidemic. In all these cases, therefore, it must be assumed that

the protection given by the operation originally has been in *some degree* lessened by the efflux of time. How much it was weakened in each case will depend upon three conditions: (a) on the "efficiency" of the original vaccination; (b) on the length of time since the operation was performed; and (c), possibly, upon peculiarities of individual constitution which make one person more or less susceptible than another to the protective influence of the vaccine, or upon a certain degree of natural immunity which some persons appear to possess.

Whilst, then, the term "unvaccinated" is a perfectly precise one, about which there can be no possible misunderstanding, the expression "vaccinated" is uncertain, and may mean anything, from the fleeting protection given by a single poor vesicle, to the almost perfect and long-protracted immunity which is conferred, as a general rule, by not less than four good ones. The fallacy of assuming that the word "vaccinated" has in all cases a precise and uniform meaning is one which is commonly exhibited by anti-vaccinators in dealing with vaccination statistics, and it is easy by its use to misinterpret the lesson which such statistics, when rightly appreciated, tell. For, so long as persons who have been vaccinated in infancy fail to renew the protection which they have thus obtained, by re-vaccination at least once in after life, so long will they be exposed to the risk of catching small-pox, with a severity proportionate to their ages, and so long also will all epidemics, especially in communities where infant vaccination is well maintained, be swollen by cases of so-called "vaccinated" persons.

That this contention is true is unmistakeably shown by the relations of age incidence to attacks in the first of the two tables given above. For, whilst only 25 cases out of the 1228 "vaccinated," or just 2 per cent., were under 10 years of age, the numbers increase in a very marked degree up to 30 years, and though from that age upwards the increase is not *apparent* it is nevertheless real, since in any given number of persons at 10 years of age there will be a steady decrease as age increases, in consequence of death from other causes. Hence the 272 "vaccinated" persons over 40 years who were attacked represent not 22 per cent., which is the proportion that 272 bears to 1228, but a much larger proportion, since a considerable number of any 1228 persons at 10 years of age would have died before they reached the age of 50 from other causes than small-pox, and, therefore, there would have been so many fewer liable to be attacked.

It is only further necessary to say that the "uncertain" cases referred to in the tables were cases in which, from deficiency of trustworthy evidence, it was impossible to say whether the patients had been vaccinated in infancy or not. The probabilities are that if they were, the vaccination had not been successful. But they are not sufficient to affect the question one way or another, and may be disregarded.

Now, what is the general lesson to be learned from these statistics, and what answer do they give to the threefold question, "how far does efficient vaccination in early life, and re-vaccination in later life, protect against (a) an attack, (b) a severe attack, and (c) against death from small-pox?"

In applying these statistics to answer this question, it will be advisable to take the last item first. Our knowledge about deaths from small-pox is precise. When a man catches small-pox and dies there is no mistake about it. His death may not, it is true, be wholly due to the infection of the disease, as it may have been promoted by other causes, such as the existence of previous constitutional disease. But, whether this be so or not, death represents the worst possible result that can happen to him, and if we can properly estimate that we can dispense with an answer to the other two questions, as to the effect of vaccination on the general liability to attack and upon its severity, for both of these incidents are necessarily directly proportionate to the liability to death. In the case of any infectious disease that is liable to be fatal in its results we may be quite sure that whatever protects us, if we catch it, from the risk of death



will also protect us from the risk of having the disease severely, and, still more, from the risk of catching it at all.

The "fatality" of the attacks, therefore, as indicated by the relations between the number of persons attacked at any given age and that of the deaths at that age, in "vaccinated" and "unvaccinated" persons respectively, will be the true measure of the protective influence of vaccination, since it may be reasonably assumed that the being vaccinated or not vaccinated is the only point in which the two sets of cases differ, as the whole body of them is taken indiscriminately from those who were and those who were not isolated in the hospital.

If we take children under 10 years of age, we find that out of 25 cases of the "vaccinated" class there was only one death, or just four in a hundred. Now, in the "unvaccinated" class, out of 688 children attacked, no less than 279, or 40·5 in a hundred died. So that the fatality of small-pox in unvaccinated children under 10 years of age is clearly ten times as great as it is amongst vaccinated ones. And it must be remembered that in making this comparison we are making the very large assumption that all of these 25 children were "efficiently" vaccinated. For, in proportion as they were inefficiently vaccinated, which there is no moral doubt that the majority of them were, so is the argument in favour of the protective influence of vaccination strengthened.

If, instead of taking the unvaccinated children under 10 years of age, we take all the remaining unvaccinated cases, 93 in number, the deaths were 38, or, again, a little over 40 (40·8) per cent. of the whole.

So that, if an unvaccinated person at any age takes small pox, the odds against his recovery, so far as the statistics of the Gloucester epidemic go, are at least 40 in a hundred. But, if a vaccinated child, under 10, takes the disease, the odds against its recovery are, at the outside, not more than 4 in a hundred, and, probably, a good deal less. As the age of the vaccinated person increases the odds against his recovery also increase, for the reason already more than once given, that the protection given by vaccination in childhood gradually fades, until, when over 40 years of age, the odds may rise to 18 in a hundred. Even then, however, they are not half as great as in the case of an unvaccinated person at the same age.

But, it must be again remembered, that, in thus estimating the risks which a vaccinated person runs of taking small-pox and dying from it, we are dealing with a person who has *only been vaccinated in infancy*. So far as can be discovered, after careful investigation, not a single death has occurred, amongst the whole 2,036 attacks, in a person who had been re-vaccinated successfully, within not more than 10 years, nor less than one month before exposure to the infection. The cases in which death has occurred in persons who are alleged to have been re-vaccinated at any time are so very few, and the evidence of the re-vaccination having been successful is so doubtful, that they may be safely disregarded. For all practical purposes, therefore, Gloucester experience confirms that which has been obtained from a multitude of other sources during the last one hundred years, that successful vaccination in infancy, supplemented by not less than one re-vaccination in after life gives almost absolute protection against death from small-pox, and a proportionate protection against catching the disease at all. These conclusions, drawn from purely numerical consideration of the cases which occurred during the course of the epidemic, are still further strengthened by the evidence as to the protection conferred by re-vaccination on large bodies of persons, especially of those who have been personally brought into contact with the disease, as given in the following section of the Appendix.

Whilst it is thus easy to represent numerically the protection which vaccination confers against death from small-pox, it is impossible to portray in a similar manner the protection which it gives against the severity of an attack, and especially against permanent disfigurement, except so far as it can be estimated, as has been done above, from the general relations

between deaths and attacks at different ages. But, no one who has had the opportunity of observing large numbers of cases of small-pox, as many non-medical persons have had during the Gloucester epidemic, can fail to be struck by the general marked difference in the severity of the disease, and in the disfigurement which it leaves behind it, in unvaccinated persons, when compared with those who have been vaccinated, even though it may have been many years before. Cases may, occasionally, be met with in comparatively young persons in which the disease assumes a severe form, notwithstanding evidence of successful vaccination in infancy, but they are so exceptional that they may reasonably be attributed to purely accidental conditions, and they do not detract from but rather strengthen the general impression as to the immunity against severe attack which vaccination gives. The actual view of a ward of small-pox cases, with information as to their vaccination antecedents, has converted doubters in Gloucester who had been proof to other forms of evidence.

Is it possible, it may be asked in conclusion, for any intelligent person, with a mind open to conviction, to resist the evidence which these statistics afford as to the protection which vaccination confers not only against taking small-pox in a severe or fatal form but against taking it at all? If such a person still doubts, let him turn to the evidence given in the next section of the Appendix, founded on the experience of a large number of persons who have had ample opportunities of observing the effects of re-vaccination in protecting their own *employés* against the attack of the disease. If after perusing this mass of evidence he is still unconvinced, then certainly the experience of Gloucester in regard to vaccination and small-pox is thrown away upon him and his incredulity is hopeless.

III.—*Summary of Evidence as to the Protective Value of Vaccination obtained from Employers of Labour, Heads of Institutions, and others, in reply to inquiries by the Committee, or in other ways.*

N.B.—In some of the following communications the names of the individuals or firms are omitted for obvious reasons. The original letters still exist, and can be examined for purposes of corroboration if necessary.

In order to prevent misconception in connection with some statements in the following evidence as to persons having developed small-pox shortly after vaccination or re-vaccination, it is well to mention that it takes generally 14 days from the first reception of the infection of small-pox before the earliest symptoms of the disease appear. It also takes from six to eight days for the protective influence of vaccination to be fully established. Hence, if a person was vaccinated on the 1st of the month, and exposed to the infection on the 7th, he might develop an attack of the disease on the 21st, but it would probably be very mild, unless the original dose of infection was very large, and that of vaccination correspondingly small, *e.g.*, from one poor bleb.

It is to be noted that the evidence here given is only a selection from a large mass obtained, the chief object being to illustrate the report by the experience of those who have had under their management or observation large numbers of persons. So far as the individual cases are concerned, which illustrate, often in a startling way, the protective influence of vaccination, they could be largely multiplied, if necessary. But it is believed that enough are given to convince any person who is open to conviction of a fact which no one who has had any practical experience of small-pox at all doubts.

GLOUCESTER COUNTY ASYLUM. (Supplied by F. Hurst Craddock, Esq., Superintendent.)

Staff and their families :—

Primary vaccinations .. .. .	22
Re-vaccinations .. .. .	215
	<hr/> 237

Patients :—

Primary vaccinations—60 males; 90 females	150
Re-vaccinations .. 445 .. 499 ..	
<hr/> 505	<hr/> 589
	<hr/> 1094
	<hr/> Total..1481

Total number of persons attacked by small-pox, 4; *viz.*, one male and two female patients and one nurse. One female patient died of hemorrhagic variola, the other three recovered. The type of the malady in the male patient was confluent and very severe; in the other female patient it was discrete and mild. Of these four cases, one, the fatal case, had never been vaccinated until she was done two or three days before being attacked; a second, the male, was vaccinated in infancy, but not again until within a few days before the attack; the two other cases had been vaccinated in infancy, and re-vaccinated. and one of them is reported to have also had small-pox some years ago. The large number of primary vaccinations in a community of adults, as this is, is explained by the fact that no evidence could be obtained of their having been vaccinated previously.

*Note by Committee.* The experience of the County Asylum is one of the most striking in the course of the epidemic. Although every practicable precaution was taken by the authorities at the outset of the epidemic to isolate the patients from the risk of contact with the infection, by rigid rules as to the visitation and admission of patients, and by the re-vaccination of the whole of the staff, one of the female patients was suddenly attacked in the middle of March. How the infection was introduced could not be satisfactorily ascertained. But there it was, like a lighted fuse inserted into a barrel of gunpowder, in the person of a patient in one of the general wards. She was at once isolated, the whole of the patients were vaccinated, and the explosion, which would have otherwise been certain and terrific, was, by the prompt action of the Superintendent, reduced to the "fizzle" of the three other cases alluded to above. It is not often that such a well authenticated and conclusive proof of the efficacy of vaccination as this can be obtained.

**H.M. PRISON, GLOUCESTER.** (Information supplied by Dr. O. Clark.) In the month of May, a male adult prisoner was attacked with confluent small-pox. He had been in the Prison sufficiently long to make it certain that he had not brought the infection with him. No clue could be discovered to the source from which he received it. The whole of the staff, most of whom lived outside the Gaol, had been previously re-vaccinated, and the prisoners were in process of being vaccinated when the disease broke out, but the prisoner who was attacked had not been re-vaccinated. The total number of the prisoners and staff at the time was about 100. No one else was attacked. The patient recovered.

**GLOUCESTER POST OFFICE.** (Information supplied by W. H. Godby, Esq., Postmaster). Total staff employed 221. Contracted small-pox, 2. When these two officers came up for appointment some years ago they were rejected by the medical officers and in consequence were not re-vaccinated. One of the two was re-vaccinated when the epidemic was at its worst, but he must have then actually contracted the disease as it shewed itself within a very few days afterwards. Mr. Godby adds: "All persons placed upon the establishment of the Post Office must be re-vaccinated, and I know of no better illustration of its efficacy than the case of the Gloucester Post Office *employés* during this epidemic. Postmen are constantly moving about delivering and collecting letters in infected districts. Sorting Clerks have to deal with letters which must convey infection; and Counter Clerks are, of course, continually in contact with the public, yet no person upon the established staff at Gloucester has contracted the disease. The Medical Officer ordered compulsory absence in 13 cases, in consequence of Small-pox breaking out at the houses of these men. In all cases the men themselves were either re-vaccinated, or they bore such very distinct marks of former vaccination as to render another operation unnecessary. Only one of the number was opposed to vaccination, and he has had four children attacked and one has died. In nearly all other cases vaccination of the members of the families who were attacked had been neglected."

*Gloucester Police Force* (Information supplied by Mr. Deputy Chief Constable Philpott):—The Police force of the division consists of 61 members, all told, the whole of whom, together with their wives and families, have been vaccinated or re-vaccinated (except the wife and two children of one constable), with the result that *not one member of the force has been attacked with small-pox, and only the wife and two children, mentioned above, took it.* This constable was a great anti-vaccinator, and had more to say about it than all the rest. His family consisted of his wife and three children. He and his youngest child were vaccinated after his wife and two children had been removed to the Hospital, and escaped the disease. They are all now in favour of vaccination. In another case, a constable



with his wife and family, all vaccinated, lived in a house which had small-pox on each side of it, the backs of the houses coming together, but none of them were attacked. Another constable has been employed with the small-pox van removing patients to the Hospital, from the commencement of the epidemic; but neither he nor his wife or children, all vaccinated, have been affected. There have been cases of small-pox all round the Police Station, and nearly the whole of the married constables reside in the part of the city in which the infection has been hottest.

*The Great Western Railway Company.* (Information supplied by Mr. E. M. Bridger, Station Master.) "The staff employed in both the Passenger and Goods Departments number 244. Of these, 223 were vaccinated, and none of them took small-pox. The remaining 21 were not re-vaccinated, and nine of them were attacked, the remaining 12 escaped. The following is given as a striking instance of the efficacy of vaccination. A signal man had a daughter who sickened with small-pox and died. As soon as the disease was recognised the father left his home with a son who had been re-vaccinated about a month. They left the house together, and both slept in the same bed for about a week, when the father sickened with small-pox, and his case is reported to have been a severe one. But notwithstanding the lad had slept with his father for a week he escaped the disease. The father had not been re-vaccinated."

*Gloucester Railway Wagon Co., Ltd.* (Information supplied by A. Slater, Esq., General Manager.) Out of about 950 men employed by the Company at the time of the outbreak of the epidemic, including clerks, foremen, &c., all were ultimately re-vaccinated except five, who preferred to leave. The total number attacked was 42. Of these, four were attacked in February, one of whom died; 16 in March, with one death; 17 in April, with one death; four in May; and one in July. From April 4th to April 11th there were 245 vaccination tickets issued to those men who would take them, and from April 25th to May 2nd a further issue of 225 was made. Others had been re-vaccinated by other agencies, but it is impossible to say precisely how many. On May 7th, Dr. Bond and one of the staff of Vaccinators from the Vaccination Office visited the Works, and, with the aid of earnest persuasion from the General Manager, succeeded in getting a number of the more determined anti-vaccinators to submit to the operation.

Of the four cases in May, one was attacked on the 4th, one on the 9th, one on the 21st, and one on the 28th, after which date there were no more attacks until the 18th of July, when one more case occurred. Four cases of small-pox occurred in men who had undergone re-vaccination, one of them as late as May 21st, but there is no evidence as to whether in any of these cases the re-vaccination was successful.

[*Note.*—There is reason to believe that few, if any, of the operatives employed at this establishment were re-vaccinated before the first week in April. If 21 days be added to this period, so as to exclude the possibility of infection before the vaccination could produce its full effect, it will be seen that only four cases in May and one in July are left to be accounted for. In one of these cases, the last, the re-vaccination is admitted not to have been successful.]

*Mr. Hubert Waddy, Secretary of the Gloucester and Birmingham Navigation Co.,* writes: "The staff of the Company, with the workmen, numbers about 50. All were re-vaccinated by the Public Vaccinator, except one man who preferred to be operated on by a Veterinary Surgeon, and subsequently took small-pox, but, I believe, very lightly."

*The Manager of the City of Gloucester Tramways* writes:—"Out of a staff of 35 men and boys, 32 were vaccinated or re-vaccinated. Three men who were not re-vaccinated took the disease, and one man died. Neither myself, wife, children, who were also re-vaccinated, nor any of the other 32 *employés* were attacked."

*The Manageress of the Gloucester Nursing Association* writes — "The number of our trained nurses was 23, of whom two had had small-pox; the others were recently re-vaccinated. The number of women engaged at various times, in waiting on patients, doing laundry work, etc., was from 45 to 50, of whom 8 had had small-pox, all the others having been re-vaccinated. There was not a single case of small-pox amongst the nurses or workers. Upwards of 940 cases of small-pox were nursed by the staff. Of these cases a few had been re-vaccinated and took small-pox very slightly, were ill for 3 days, perhaps, but not kept in bed more than one day."

*Dr. Brooke, Superintendent of the Gloucester Small-pox Hospital*, writes, in reply to an inquiry whether he had met with any case of a small-pox nurse who had taken the disease after being effectually vaccinated: "No, I have never seen such a case either in Gloucester or elsewhere, and I have looked through our Annual Reports of the Statistical Committee of the Metropolitan Asylums Board, and cannot find there any such case recorded, though many hundreds of people, nurses, workpeople, &c., have been employed at our Small-pox Hospitals at London."

*Messrs.* — write: "We employ about 110 men and boys. To the best of our knowledge and belief the whole of these have been vaccinated and re-vaccinated, with the exception of two elderly men over 60 years of age. Three of our workmen have been attacked with small-pox; two of them recovered and one died. Neither of them had been re-vaccinated."

*Messrs.* — write: "Only one of our *employés*, a youth of about 18, who had not been re-vaccinated, was attacked by small-pox, and recovered. Fifteen have been re-vaccinated this year and five some years ago, when in the militia. The remainder, about 20 in number, have not been, we believe, re-vaccinated; of the latter, three are quite old men."

*Messrs. Price, Walker, & Co., Ltd., Timber Merchants*, write:—"At the beginning of May we were employing about 210 men, of whom about 180 were vaccinated on our premises, about 26 were done at home, and four, through old age and various reasons, were not vaccinated. We had no cases of small-pox amongst the men after they were vaccinated, and only one man who was seriously indisposed from the effects of vaccination. We had about four or five cases before the men were vaccinated."

*Messrs.* — write:—"At our Gloucester house our staff and *employés* number about 65. Amongst our workmen we have had three cases of small-pox, one of which terminated fatally. After this death, many of the workpeople who had previously resisted all persuasion, offers of free vaccination, and appeals of all sorts, were re-vaccinated on their own account, we believe, we having withdrawn our offer to defray all expenses, after we had made it and repeated it two or three times. All three of the men who suffered had been vaccinated in infancy, but not since. One who went into the Hospital a strong "Anti-vaccinist" was completely cured of his delusion by his experience and what he saw around him. He said, 'You need not go into the Hospital to prove it; you need only look through the windows to see the marked difference in suffering between those who had never been vaccinated, and those who had, even if only in infancy'

*Messrs. Foster Bros., Ltd., of the Gloucester Oil Mills*, write: "Out of 109 men in our employ 108 were vaccinated or re-vaccinated. The one exception had already had small-pox, and it was not considered necessary to do him. Two men had small-pox a few days after vaccination, but so slightly that they were about in less than a fortnight, and neither of them was marked."

*Messrs.* — write to the following effect ;—" Number of *Employés*, about 250. Of these, 195 were re-vaccinated at the factory, and all the rest, except 5 or 6, at the public stations or their own homes. One man only (and no woman) had the small-pox; he was re-vaccinated on Saturday, and the case was notified on Monday. Some of the work-people had the disease in their own homes.

*Messrs. Sully & Co., General Drapers*, write that their *employés* are 13 in number, of whom 12 have been re-vaccinated, and none have been attacked by small-pox.

*Mr.* — writes :—" Weeks before the disease reached its height I thought it my duty as a citizen, and also as a small employer of labour, to have myself and family re-vaccinated, and then to do all I possibly could to get my *employés* to do likewise. I am pleased to say that after a little persuasion, and without any undue pressure, six out of seven were re-vaccinated. The seventh, I am sorry to say, was not until after a little child living in the same house was sickening for small-pox. He was then advised by a medical man to leave the house. On his acquainting me with the fact I told him he must be re-vaccinated before it would be safe for him to return to work, which he was. However, in three or four days he developed the disease. Not one of the six who were re-vaccinated has had small-pox. One of them has delivered oil from house to house all the time in the streets where small-pox has been the worst."

*Messrs. Fisher & Fisher, linendrapers, &c.*, write : " We are glad to report that our belief in the protective value of vaccination is not only fully confirmed but greatly strengthened by the sad experience our city has had. All our household and business establishment generally (over 30) were vaccinated, principally from choice—some few under strong persuasion: but all have escaped and are now full believers in the efficacy of vaccination."

*Messrs. C. Healey & Son, carriage builders*, write : " Forty of our *employés* were re-vaccinated and not a case of small-pox has occurred amongst them."

*The Secretary of the Gloucester Coffee House Co., Ltd.*, writes : " The number of the *employés* of the Company is 15; all have been re-vaccinated and none of them have been attacked by small-pox."

*Messrs. R. T. Smith & Co., general carriers and shipping agents*, write : " All the staff at our stations in Gloucestershire were re-vaccinated (with the exception of two or three men who had had small-pox, and with regard to whom the profession did not consider vaccination necessary). None of them were attacked in the recent epidemic."

*Messrs. Priday, Metford & Co., City Flour Mills*, write : " Dr. Bibby in March last vaccinated our *employés* (58) with entirely satisfactory results, as not one of them have suffered in person from the epidemic."

*Messrs. Denton & Holbrook, silk mercers, &c.*, write : " We employ about 70 persons, male and female, the whole of whom have been re-vaccinated, and we are thankful to say not a single case of small-pox has occurred amongst any of them."

*Messrs. W. Herbert & Sons, drapers, &c.*, write : " Our *employés* during the epidemic numbered 58, including servants and porters. They were all vaccinated or re-vaccinated and we have not had a case of small-pox amongst them."

*Messrs.* — write : " We have during the recent epidemic employed 25 hands (average) weekly, all re-vaccinated, with a result of not one case of small-pox. Although the wife (unvaccinated) of one of our men contracted



small-pox and died, he came off quite free of the disease, notwithstanding he was living in the same house with his wife up to the time she was taken to hospital. Another case was that of a man (unvaccinated) lodging in the house of one of our men, who also came off free, though living in the same house and helping to attend the one afflicted for several days."

*The Proprietor of one of the largest Hotels in Gloucester*, writes: "I have in this hotel 19 people always living here, viz.: myself, wife and three children, and a staff of 14 servants. Everyone has been re-vaccinated, and although many of the servants have their homes in infected streets I have not had a case of small-pox on the place."

*Mr. A. V. Hatton, of the Northgate Brewery*, writes: "I have 10 *employés*, all married except one, and all re-vaccinated. None were attacked by small-pox. The whole of their children, excepting one daughter of a man named B., were either vaccinated or re-vaccinated. This daughter held back from re-vaccination until her sister's arm had got well: in the meantime she took small-pox, but had it only slightly, was nursed at her own home, and the other members of the family, who had all been re-vaccinated, escaped.

*Dr. Oscar Clark* writes: "The following cases which came under my own observation appear to me to be worth recording.

S., Llandilo Street. The mother, a former servant of —", refused to be re-vaccinated, and none of her four children had been vaccinated except one which was born at Berkeley and had been vaccinated there. This child was the only person in the house that escaped, the father, who was vaccinated in childhood, having a slight attack.

In a second family, the husband took the disease, but as the baby was suffering from bronchitis I thought it inexpedient to vaccinate it. The rest of the family, consisting of mother and five children, were. The baby was the only one, except the father, who took the disease.

In a third case, I vaccinated all the family, five in number, except the mother, who was recovering from a severe abscess of the face. She was the only one who took small-pox.

In a fourth family, the wife, not re-vaccinated, took the disease; the husband and four children, who were re-vaccinated, escaped.

During the epidemic, I felt that the only chance lay in vaccination, and I laid myself out to vaccinate all I could. I was so busy that I kept no record of the numbers, but I and my Assistant spent whole days vaccinating. I also sent a special circular to one of the largest Clubs in the City, for which I am Medical Officer, with the result that most of the members and their families were guided by me and were vaccinated. I am exceedingly glad to say that *not one* of the cases I have vaccinated has taken the disease, except where they were already infected (about four cases). In one case, hours of argument were thrown away upon an anti-vaccinator, who absolutely forbade his children to be vaccinated. I, however, managed to do so, with the result that when he himself subsequently took the disease, the wife and children all escaped.

[The subjoined letter, which is referred to in the evidence of Dr. Oscar Clark, is an interesting illustration of one of the various ways in which members of the medical profession exercised their influence under a sense of the responsibility imposed upon them.]

LOYAL PHENIX LODGE OF ODD-FELLOWS, M.U.

Gloucester,

February 24th, 1896.

Dear Brother,

Ever since the first outbreak of small-pox in the City I have been uneasy in my mind as to my responsibilities with regard to vaccination.

\*A leading anti-vaccinator.



Now that the disease has broken out among children in the Widden Street Board Schools my uneasiness has much increased.

Hitherto the disease has chiefly been among adults, who are themselves responsible if they have not been vaccinated or re-vaccinated.

In the case of children the responsibility is divided between the parents and the parents' advisers.

As you have, by joining the Medical Aid, chosen me as the medical adviser for your family, I feel that I am sharing the responsibility of your children being possibly unvaccinated, and therefore unprotected against the infection of that terrible disease small-pox, unless I free myself from that great responsibility by *most strenuously* pressing upon you the extreme importance of their being so protected by vaccination.

I therefore take this opportunity of telling you that my trust in vaccination as a perfectly safe and almost sure protection against small-pox is absolutely firm, and has received very startling confirmation from what I have myself seen during this epidemic.

I have treated the mothers and children connected with this Lodge now for some seven or eight years, and I know that many families have perfect confidence in my knowledge in medical matters, so it is but reasonable that my words should have some weight in this question, which is a purely medical one, and a question where the views of an outsider must necessarily be almost worthless.

In order that every inducement for vaccination should be given, I have determined to vaccinate, free of charge, any child belonging to the Medical Aid, and I undertake to use calf lymph of the best quality procurable, and from the same source as that from which I vaccinated my wife and children, and have been myself re-vaccinated a few weeks ago.

In the case of re-vaccination, I merely ask that the cost of the lymph should be repaid, *i.e.*, one shilling for each person re-vaccinated.

I sincerely hope that you will trust me in this matter, for I cannot tell you how troubled I have been when I have seen children suffering with small-pox of a severe form (no words can exaggerate the fearfulness of this disease in such cases), feeling as I do that the child's suffering and danger to life and eyesight might, in all human probability, have been avoided if they had been vaccinated.

Yours fraternally,

BRO. OSCAR W. CLARK.

*Mr. J. Crofts, Head Master of Sir Thomas Richs' School*, writes: " Pupils attended the School from all parts of the city and the surrounding districts. This might lead to the conclusion that we had more than an average number of cases connected with the School. This, however, has not been the case. At the beginning of the year there were 261 boys on the books, and during the whole time we have had but three cases. One was unvaccinated; and the two, who had it slightly, had not been re-vaccinated. All the other boys, except six or eight, have been vaccinated or re-vaccinated; and the School has not been closed except at the usual holidays."

*Mr. W. Hobbs, Head Master of the Tredworth Board School*, writes; " Here-with a few facts *re* vaccination and its benefits or otherwise.

J. C.; re-vaccinated; contracted small-pox; inquiry discovered that he had poulticed his arm directly after the re-vaccination.

Family of J. All the family vaccinated or re-vaccinated except the mother, who contracted small-pox, the children escaping, though shut in the house with her during the whole time of her illness.

Family of G. Father re-vaccinated; mother and three children not. The four latter contracted small-pox, of whom two died; the father, who nursed them, escaped.

Family of M. Six of this family who were vaccinated escaped; the mother and three of the children, none of whom were vaccinated, all took the disease.

Family of G. Father, mother and four children, latter not vaccinated and the former not re-vaccinated, all took the disease and died.

Family of C. Eldest girl was a servant of ours, and was re-vaccinated under our influence. Seven of her brothers and sisters contracted the disease, of whom one died. Two of the children were vaccinated, but, whilst their arms were taking, a brother contracted the disease; these girls also took small-pox, and one of them died. The rest were either unvaccinated or had not been re-vaccinated. The girl referred to nursed them all and escaped.

Family of C. One son caught the disease, whereon the father, mother, and the other children were vaccinated. They all escaped, but the son referred to is fearfully marked, and has lost his hair.

Out of 35 teachers here two only refused at first to be re-vaccinated. One of the two contracted small-pox and will be marked for life (in spite of Professor P.); the second rushed to the vaccinator and escaped.

I could multiply such cases, but they are so similar it would be waste of time.

One man in this neighbourhood has 37 descendants, all vaccinated: none contracted the disease. His brother has 21, none re-vaccinated; 10 have had small-pox. About 250 of our children were attacked, with 30 deaths."

*The Rev. J. J. Luce, of St. Nicholas Vicarage*, writes: "There have been, in all, 31 cases of small-pox in our parish during the course of the epidemic. The ages varied from 17 days to 58 years. (1) A baby of 17 months was successfully vaccinated on April 9th, taken with the disease on April 20th, and recovered. The child's mother refused to be re-vaccinated, and, after nursing the babe, was taken on May 4th, and died May 10th. (2) Another baby of 16 months was vaccinated March 25th, the day before developing the disease, and died on April 3rd. (3) A man, aged 55 years, was successfully vaccinated on April 26th and taken with the disease four days afterwards. He has recovered, and has no marks whatever on his face. The 28 other cases were all unvaccinated or not re-vaccinated.

A child of 15 was said to have been vaccinated, but upon enquiry was found not to have been vaccinated at all. A young man who contracted the disease had been vaccinated two months before, but unsuccessfully. A woman, aged 55, who refused to be re-vaccinated because she had had small-pox, had it the second time.

In St. Stephen's Court we had 13 cases. All the children protected by vaccination escaped, though many were living in the same house in which there were patients at the time. For instance, five children, one of whom was a baby at the breast, escaped, although the mother took the disease.

In addition to the cases belonging to the parish we had one worth recording in the Schools. A boy, unvaccinated, died; his brother, vaccinated, was quite free, and is at school. In the same family the father, mother and one daughter, all re-vaccinated, were exempt, whereas another daughter, aged 19, who was not re-vaccinated, had the disease slightly. They all mixed freely together the whole time, and some slept together."

*The Rev. W. C. Macklin, of the Church of the Good Shepherd*, writes: "Amongst all the cases which have come under my notice I have not found one where a vaccinated child under 10, or a recently successful re-vaccinated person above that age, has taken small-pox. One boy (C. H., of Sidney Street) was re-vaccinated and had small-pox within a few weeks, but his mother told me that his arm 'never properly came up.' The saddest case amongst those which have come under my notice was that of the B's of Twyver Street, a family of ten, none recently re-vaccinated, and the four youngest not vaccinated at all. All the family had small-pox, and the four unvaccinated ones died. It was claimed by the advocates of the — treatment that it would 'stop the infection and stamp out small-pox' and thus render vaccination unnecessary; but, out of about 35 cases

which they have treated in this district, 11 occurred in houses in which the treatment was already being used; three of these 11 died, and all might have been avoided by prompt isolation in the first instance."

*The Rev. S. E. Bartleet, Vicar of S. Mark's*, writes: "We have had nearly 80 cases of small-pox in my parish and, with scarcely an exception, I have visited all of them, and I have also paid many somewhat lengthened visits to the Small-pox Hospital. I have had an opportunity, therefore, of seeing not a little of the recent epidemic and of noticing the class of persons attacked. Almost entirely they have consisted of unvaccinated children and adults who had not been re-vaccinated. The youngest child vaccinated in infancy who was attacked in my parish was a girl between 10 and 11 years of age, and her attack was a very slight one. Two others in the family contracted the disease, of whom three children were unvaccinated, and the mother had not been re-vaccinated. The contrast between the vaccinated child and her unvaccinated sister, two years younger, as they sat up in the same bed at the Hospital, was most remarkable. The one had scarcely a spot whilst the other's face was covered, and is disfigured still. The wife of one who was recently and is, perhaps, still an anti-vaccinationist, said to me, 'it is so unfortunate that the disease so uniformly picks out the unvaccinated.'

I only know of two recently re-vaccinated persons who have taken the disease. One is a young woman who was acting as nurse to a bad case. Only one of the vaccination incisions took very slightly, so that it could not be considered a case of successful re-vaccination. Her attack was very slight indeed. The other case was the young woman's brother, whose attack was also a slight one. I saw one case of a person re-vaccinated in the army ten years before. The attack was so very slight, just two or three pock marks on the arm, that the doctor hesitated to call it small-pox. Probably, however, it was a case of the disease, as a brother in the same house, who had not been re-vaccinated, had a severe attack. The experience of other places has held good in my parish, that those visiting or ministering to the sufferers, when re-vaccinated, have all of them escaped. An idea prevails amongst the poor that doctors and parsons have some secret mode of protection. Only to-day this answer was given to me when I asked how it was I was not stricken, though I had been to every infected house.

Sometimes a person who has not been re-vaccinated has seemed to resist contagion for a while and then has contracted the disease. The last case in my parish is an instance. A mother nursed a daughter who had small-pox very slightly, without herself suffering. After the daughter's recovery a married son took the disease in a worse form, and the mother went to nurse him. She refused to be vaccinated, and her immunity on the first occasion of exposure to the disease seemed to justify her in her resolution; but she now has a rather severe attack of small-pox."

*Rev. H. H. Vowles, of Northgate Street Chapel*, writes: "I have every confidence in the protective value of vaccination, and did what I could from the pulpit, as well as privately, to express that view, and with some success, as I don't think we have a single 'anti' left at Northgate Street, or any unvaccinated person."

*Mr. Vinson, Secretary of the Gloucester Gas Light Co.*, writes; "All employed at these Offices, 27 in number, including clerks, collectors, meter inspectors, fillers, and lamplighters, were vaccinated (a few before April, the rest during that month). We have not had a single case of small-pox amongst the staff."

*The Gloucester Gas Works*. (From information by Mr. R. Moreland, Manager.) The number of men employed during the early part of the year would be about 50. Of these, 5 took small-pox. One of these men was nursed at home by his wife, who refused to be re-vaccinated, and contracted the disease. Another died after only a few days' illness. A third



had an unvaccinated child who took the disease and died. The father lodged away from home during his child's illness, but, on returning, contracted the disease, whilst his other children, who had been vaccinated, escaped altogether. Neither of these 5 men had been re-vaccinated. All the other men, with one exception, were re-vaccinated in April.

*The Secretary of one of the largest Friendly Societies* writes: "My experience during the recent epidemic has brought to my notice numerous instances of the protective value of vaccination and re-vaccination; and I should like to see vaccination enforced all over England, fully believing that nothing better could be done to protect the nation against small-pox."

*Mr. A. Estcourt, Builder and Contractor*, writes: "I cannot give you any fixed number of *employés*, as our work lies so much away from Gloucester. We may put the average for some time past in Gloucester at 40, most of whom have, I believe, been re-vaccinated. There are a few old hands who had small-pox years ago, and they have not been re-vaccinated nor had the disease again. We have only had two cases. One a young man who came from a country job and took the small-pox and died in the hospital. I cannot ascertain as to his vaccination in infancy, but he had not been re-vaccinated. A man named M. had been re-vaccinated some time ago in the Army, and has escaped; so have all his children, who were vaccinated. His wife deferred it, and caught the small-pox, and was suckling a baby who had been vaccinated three weeks before. The baby caught it, I presume, from the mother. They both went to the hospital and died."

*Messrs. S. J. Moreland & Sons, of the Gloucester Match Works*, write: "We employ about 470 hands. At the commencement of the epidemic six had small-pox, of whom two are rather badly marked. None of these had been re-vaccinated. Since re-vaccination of all the hands there have been two cases of small-pox, one occurring three days after re-vaccination; the other is stated to have occurred two months after the operation. All the work-people live in infected districts."

[*Note*.—The latter of the above two cases was investigated, and it was satisfactorily established on the evidence of two medical men who attended the young woman in question that her illness referred to was not small-pox.—F.T.B.]

*The Collector of Customs* writes: "Nothing of a striking character has come under my observation illustrative of the protective value of vaccination, beyond the fact that the whole of my staff are brought more or less in contact with the public, and that, with one or two exceptions, all have recently been re-vaccinated, and none of them have suffered from small-pox. The whole of my own household (9 in number) have been either vaccinated or re-vaccinated just lately, and none of them have taken small-pox."

*Mr. A. King, Builder and Contractor*, writes: "I and all my family believe in vaccination, and were all of us successfully vaccinated at the outbreak of our trouble. I, as you doubtless are aware, established the Small-pox Relief Fund, and more than £900 has come to hand, besides large consignments of clothing. The distributions have been made by myself, three sons, and by Miss King, who has done the clothing department. Thousands of visits have been made to the houses and families where they have been afflicted, and I am happy to say that we have not been attacked. This of itself is a strong argument as to vaccination being a certain preventative. After a lot of persuasion we induced all the men in the employ of self and sons, 25 in number, to be vaccinated with the exception of one man, who, poor fellow, took the small-pox, from which he died, as also did his daughter."

*Messrs. Reynolds & Co., of the Albert Flour Mills*, write: "The number of our *employés* who were vaccinated here at our cost was 74; vaccinated privately, six. Most of these were re-vaccinations, and all were done



within the week March 13-18. Of these 80 men and boys, 10 were subsequently compelled to assist in nursing friends or relatives who had contracted small-pox, and who were treated at their own homes partly or entirely. Of the 10 so directly in contact with the disease, not one fell ill or was in any way affected by the disease, and they all resumed work on medical certificates after the usual quarantine period. Of the entire number of our *employés*, one only fell ill with small-pox, and the circumstances in his case were somewhat peculiar. He was obstinately opposed to being vaccinated, but ultimately agreed to the operation, and was, he says, vaccinated by Dr. ——. He did not go again to show his arm, and we think it doubtful whether he was successfully vaccinated. He, however, contracted small-pox, but not until his wife had undertaken the duty of nursing small-pox patients. In this capacity she was admittedly passing from severe cases of small-pox to her own house in which the man we refer to was then residing. Apart from this singular case, we consider that the experience of our workmen and our staff during the epidemic has proved conclusively the great protection against small-pox which vaccination affords."

[*Note*.—The above case was visited and examined by me at an early stage of the illness, and all that was visible on the arm was the healed wounds left by the lancet, but no evidence whatever of any characteristic scar, except from three in infancy.—F.T.B.]

The Rev. William Bazeley, *Matson Rectory, Gloucester*, writes: "This parish, containing some 350 inhabitants, is about two miles from the centre of Gloucester. Most of the men are employed in the City, the women shop there, and many of the elder boys attend the City Schools. Early in the year the children were nearly all unprotected by vaccination, and we were expecting a bad outbreak of small-pox. Fortunately, we were enabled to induce the parents to have their children vaccinated without a single exception. The result was that not one child caught small-pox. We had four cases amongst adults, none of whom had been re-vaccinated; but by isolating them we prevented the disease spreading, and it never became epidemic. The cases were none of them of a very severe type, and the patients soon recovered; all had been vaccinated in childhood.

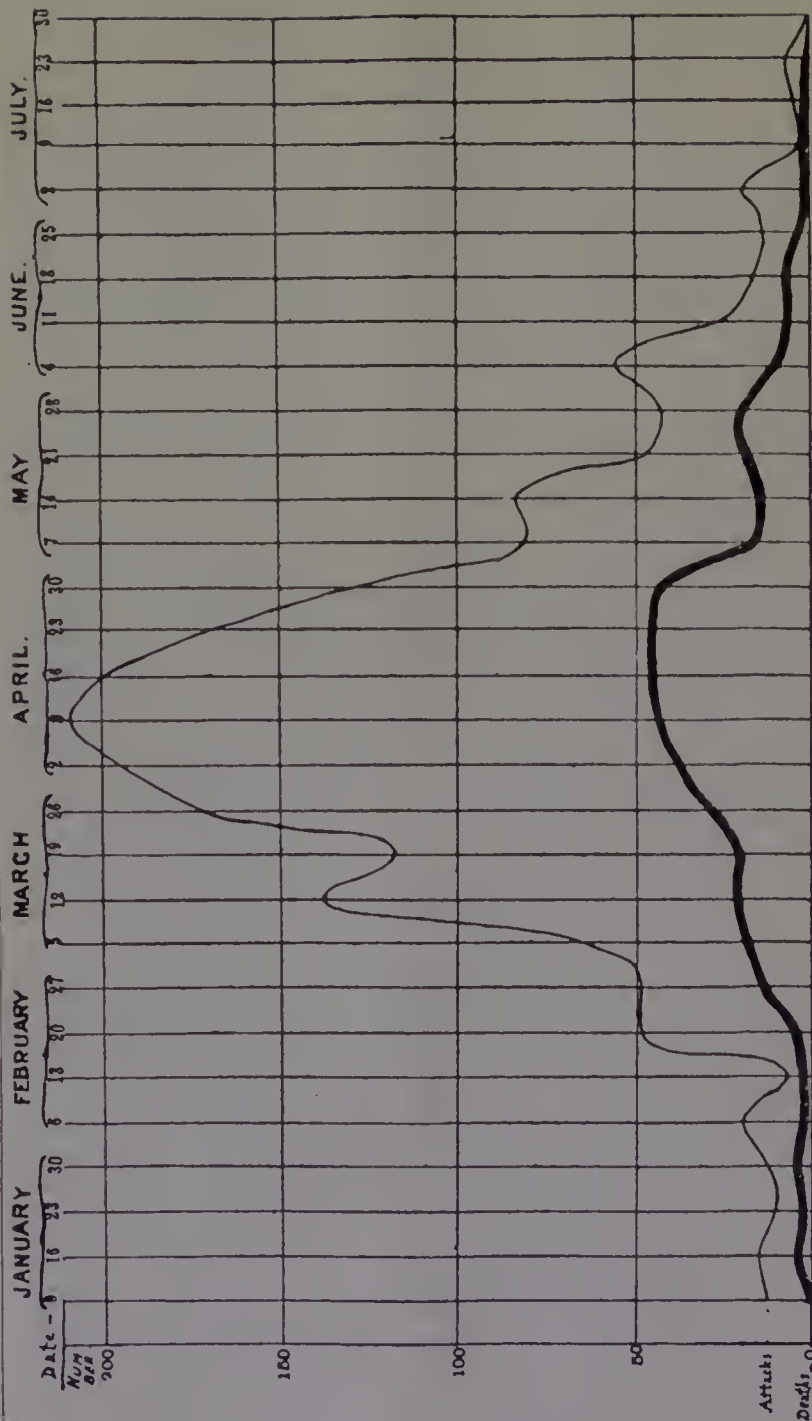
I would gratefully acknowledge on behalf of my parishioners the kind way in which the Public Vaccinator for this district, Mr. W. Washbourn, made his visit to Matson at a time convenient to the working-men and others."

*From All Saints' (Gloucester) Parish Magazine, June, 1896*.—"One has known all along how worse than useless it is to waste time and breath in argument, or even talk, with anti-vaccinators. They are so unreasonable and blind, that one can only put it down to some mental defect; but in spite of all talk, argument, disbelief, or ridicule, the fact remains, supreme and evident, that the small-pox is leaving our City and Parish simply because the great majority are re-vaccinated; and if anti-vaccinators were as honest as they claim to be they would frankly acknowledge that such is the case. Ah well! there always will be those who think their own opinion the only possible one; they are very trying to those who come in contact with them, and doubtless their own life is not a bed of roses, and the mischief they do is infinite; but it would not do to have everything too smooth in this life, and so one pities them, and hopes, with a certain amount of doubt, that they may come to a better mind; but one cannot shut one's eyes to the fact that the result of their blindness has been disastrous, and poor Gloucester is, alas! only too terrible an example, as one may see by visiting the new part of the Cemetery, which is covered with the graves of the nearly four hundred\* victims, not one of whom (in all human probability) would be there were it not for the obstinacy of the anti-vaccinators."

\*Before the end of the epidemic this number had increased to 443.

TABLE

Showing the progress of the Small-pox Epidemic at Gloucester during the months January—July, 1896.  
 [The thin (upper) line shows the number of attacks notified during each week. The thick (lower) line shows the number of deaths which occurred during each week.]



Although there are a few minor irregularities in the curves, due in some degree to irregularities in the dates of notification, the following facts are clearly brought out in the above diagram :

1. The general correspondence between the two curves : a rise in the attack-line being followed within about a fortnight by a rise in the death-line, showing the average length of the period of sickness.
2. The suddenness of the increase at three dates, *viz.*, the third week in February, the first week in March, and the third week in April : the last-mentioned rise being continued until the second week in May.
3. The suddenness of the decrease in attacks after the middle of April, within a fortnight of the date when serious efforts to promote vaccination and re-vaccination were commenced.
4. The checks in the downward progress of the curves during May : a time when many cases, owing to disturbing influences, were withdrawn from regular medical treatment and from lying in the Hospital, the survivors being allowed to go abroad freely while still capable of infecting others.